



FRIDAY, AUGUST 6.

Reese's Bell-Ringer.

In many localities it is very desirable that the bells of locomotives should be rung continuously to give warning of the approach of the locomotive. To do this by hand involves a great deal of labor, and also takes the attention of the engineer and fireman from their other duties. A number of devices have therefore been invented to ring the bell by steam, one of which is illustrated by the engravings herewith.

Fig. 1 is a longitudinal section of it, fig. 2 an end view, fig. 3 a side view, and figs. 4 and 5 details. *A* is a flat steel bar $\frac{3}{16} \times \frac{1}{2}$ in., which is connected with the bell-crank or lever, and which moves in guides, *L L*. At one end it has a lug or elbow, *N*, against which the plunger *D* bears. *B* is a cylinder with a bore 1 in. in diameter, and 6 in. long. *C* is a piston 1 in. in diameter by 1 in. long, with two packing-rings, *R R*, and a rod or stem, *F*. *D* is a plunger which is made to work steam tight in the cylinder by a stuffing-box, *g*, and gland, *H*, and with a longitudinal hole drilled in one

Contributions.

Timber and Timber-Cutting for Railroads.

BY WM. S. HUNTINGTON.

Mr. Marshall M. Kirkman, in his recently published work on "Railway Expenditures," has clearly pointed out that a durable track is essential to the prosperity of a railroad company. Under the head of "Impolicy of Buying Cheap Supplies," he says:

"What we have said in reference to inferior track rails applies with even greater force to inferior cross-ties. A poor rail when no longer of use may be sold to the manufacturers, but a cross-tie is practically worthless when no longer available for use in the track. Besides this, its removal in many cases is much more difficult than the removal of a rail, and the alignment of the track is, as a rule, more seriously disturbed in the former than in the latter case."

"Ties manufactured from what we call soft woods are not only not able to withstand the wear and tear of heavy business, but they decay much more quickly than oak and other hard-wood ties; the cost, however, of transporting the latter and inserting them in the track is not greater than for the former; it is, therefore, manifestly for the interest of every company to use the latter when the difference in the purchase-price is not greater than the subsequent difference in the length of time the ties will last."

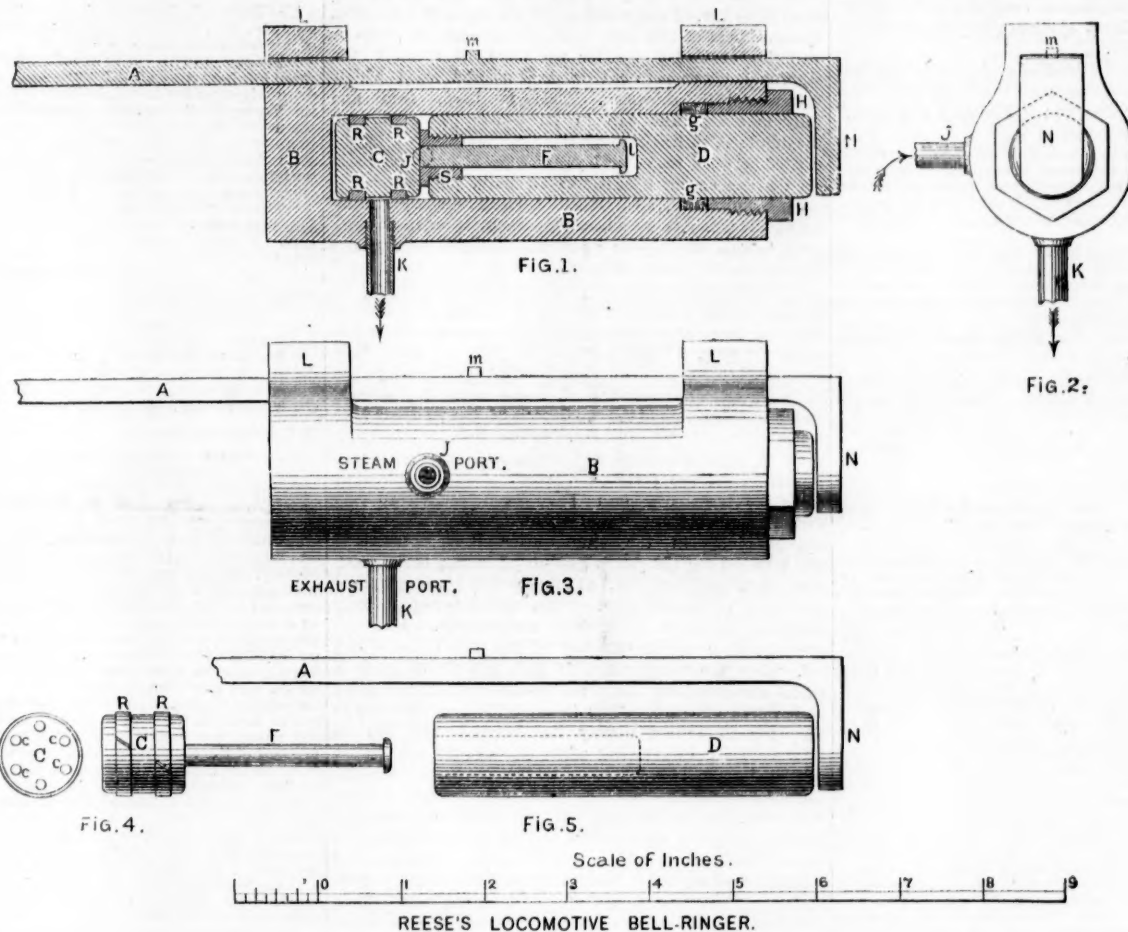
BEST WOOD FOR TIES.

Mr. Kirkman's remarks on this subject are eminently

conflicting statements, it is evident that the observations on which these statements were based were made under vastly different circumstances. In the absence of any detailed account of the circumstances under which this remarkably rapid decay took place, or any mention of the causes, immediate or remote, we will proceed to a consideration of the various causes and conditions that tend to hasten decay of timbers: Firstly, it should be remembered that we have in the United States over 400 indigenous species of trees, embracing several varieties of hemlock and cedar, while of ash there are some 40 different varieties. There are 87 oaks, 34 pines, 17 spruces and firs, and 11 maples. Thus of every kind of timber, which is at all suitable for ties, there are several varieties, and each variety has some peculiarities by which it may be distinguished from the others; some of which are favorable to durability, while others tend to hasten decay, as in the case of the hemlocks.

RED AND WHITE HEMLOCK.

One variety of this timber grows on ridges, usually termed "hemlock ridges." These ridges are usually rocky or stony, with a hard loam or gravelly and sometimes a sandy soil. Here the trees are tall, straight and thrifty, and of a dense growth. The larger of these trees, which are from two to three feet, and often larger in diameter, are sawed into ties, while the smaller growth, of suitable size, is hewed. The former is liable to be "shaky," and splits easily, while the latter is more firm, close-grained and solid,



REESE'S LOCOMOTIVE BELL-RINGER.

end to receive the piston-rod *F*. The plunger also has a sleeve, *S*, screwed into the end of the hole to prevent the piston-rod from coming out.

Steam is admitted by the port *J* (shown in dotted lines in fig. 1) and enters between the piston *C* and the plunger *D*, and the latter is thus forced out, and comes in contact with the elbow *N*, and moves the bar *A* and with it the bell crank. When the plunger has moved far enough the sleeve *S* comes in contact with the collar *l* on the piston-rod, and thus moves the piston so as to cover the steam port *J* and uncover the exhaust port *K*. The piston *C* has holes *c, c*—shown in fig. 4—drilled through it, so that when the steam-port is closed and the exhaust-port *K* is opened the steam between the piston and plunger passes through the holes in the piston and escapes out of the exhaust. When this occurs the weight of the bell forces the bar back again to its original position, and the operation is then repeated, thus giving the bell the required oscillating motion. A pin, *m*, in the bar *A* prevents the latter from moving too far. The bar is also connected with the bell crank by a sleeve coupling, so that the bell can swing back farther than the plunger *D* would permit it without the sleeve.

This device has been in use on the South Pacific Coast Railroad for over a year, and is said to work very satisfactorily. The inventor, Mr. E. L. Reese, is a locomotive runner on that line. His address is Alameda, Cal.

—Mr. Wm. F. Reynolds, who died in LaFayette, Ind., July 31, was born in Ohio in 1811, and settled in LaFayette in 1831. He became an active and successful merchant there and was the first President of the old Indianapolis & LaFayette Company, whose road is now part of the Cincinnati, Indianapolis, St. Louis & Chicago. Later he acquired a large interest in the Louisville, New Albany & Chicago, and was President of that company until the recent change in ownership.

sound, but as it is necessary for many of our railroad companies to use cross-ties of various grades and varieties of timber, it is difficult, under certain circumstances, to determine what grades and varieties are the most economical to purchase. The present state of knowledge of the relative durability of the various kinds of timber used for cross-ties is so imperfect and meagre as to render it difficult to decide as to which is the most desirable; and not only this, but there is a great diversity of opinion relative to the proper season of the year in which timber should be cut in order to secure its maximum durability. The searcher after knowledge on these subjects meets with discouragement at every step; not that there is any lack of opinions, for they can be had in the greatest profusion and confusion, without the asking, but facts are not so easily obtained. The International Roadmasters' Association discussed these questions briefly at its convention at Niagara Falls on Sept. 10 and 11, 1879, and as the members of that association have superior advantages and opportunities for noting the length of time that the different varieties and kinds of timber will remain in a suitable state for use as ties, their statements may be regarded as facts, although there was a wide difference of opinion expressed as to the relative value of the various kinds of timbers for this use. From statements made at that convention it would be exceedingly difficult to determine what kind of timber would be the most profitable to use for ties. While some would choose chestnut, others would prefer oak, and others cedar; and while some had known hemlock ties to be on duty 11 years and upward, and appear good for several years' more service, others had found them completely rotten, "so that they could be shoveled out of the track in three years from the time they were laid."

Without doubting for a moment the correctness of these

and is known as white hemlock. This is the most durable variety, and will outlast some varieties of oak. These varieties are not confined to ridges, but grow scattering along the slopes and on the borders of swales and marshes, but here the growth is somewhat scrubby and small as compared to that on higher ground. The red hemlock grows thrifty along the borders of streams, on the borders of ponds, and is sometimes called water hemlock. Like other varieties of hemlock the smaller trees are the best for ties, being more hard and compact than the larger growth. This variety is, however, inferior to the white, and although all hemlock is resinous the red is more sappy than the upland varieties, which accounts for its rapid decay. Resinous woods resist decay much longer than the sappy varieties. The red, or water hemlock, from its habit of growth in or near water, secretes a considerable amount of sap, which, in some timbers, is a destructive agent, while in others it is a preservative, as will be shown hereafter.

TIME FOR CUTTING TIMBER.

The first step in the process of decay of timber is fermentation. In order for this to take place, two things are necessary: the presence of sap, and a proper temperature. A certain degree of heat is necessary to cause fermentation, and this fact leads many to the belief that timber cut in winter is the most durable, for the reason that fermentation or decay cannot take place, owing to the low temperature and the comparatively small quantity of sap in the timber at that time. Now, while the sap, and the various substances held in solution, are the principal agents which cause decay, it can be clearly shown that the presence of the greatest quantity of sap in the timber at the time of cutting does not necessarily hasten decay. To prevent decay, remove the cause, and the sooner timber is seasoned after being cut the greater its durability. Mr. Wm. Hunt, of New London,

Conn., writes in the *New York Tribune* on this subject as follows:

"Much stress is laid on the importance of cutting timber for farm purposes in August. But why in August? Any time after the leaves are fully developed and before they begin to decline is the right time, and within these limits one time is as good as another. I make this assertion after 25 years of close observation and experiment on a farm. The reasons for the superior durability of wood cut in the summer months are these: Wood cut in the winter, either for cord-wood or timber, dries very slowly—scarcely any till the following summer—and the slow warming up of the logs produces fermentation. This is the beginning of decay.

"That this is a fact any one may find out for himself by visiting a saw-mill and smelling and tasting the sawdust made from the logs cut in summer and those cut in the winter. That from the former will have the taste and smell peculiar to the wood; from the latter it will smell and taste very strongly of vinegar; not cider vinegar, but wood vinegar—a composition of wood spirits, sugar, starch and other things held in solution in the sap, converted into acid by the gradual heating in the spring.

"In consequence of this fermentation, round rails always decay first inside; split rails decay on the outside.

"On the outside of round rails there will be a thin shell of sound wood, at the same time the entire inside will be rotten dust.

"Timber cut when in full leaf dries rapidly. If split into rails or sawed into timber, the wood shrinks rapidly, the cells are closed, so that air and water are excluded, and increased durability results. There are other causes that affect the durability of wood, but those reasons here stated cover the general facts as far as the farmer is concerned."

The uses to which farmers put timber are identical with railroad uses with the exception of cross-ties, and the argument put forth by Mr. Hunt applies equally well to timber used for the latter purpose.

A correspondent of the *Detroit Post and Tribune* asks that journal, "When is the best time to cut timber for fences and buildings?" The editor answers: "February and June," and gives the following reasons:

"Because it is between the two extremes of active growth and rest. In the first, or February, the sap has pressed into the roots, the grains of timber are at rest, consequently the pores are comparatively closed and the timber is more solid and less subject to the absorption of air and water and more durable.

"In June the sap is flowing freely, the timber is alive, the grains and pores are all full. Cut it now and the sun dries the sap, forming a glazing through the whole interstices of the timber, and makes it impervious to air and water—the very thing that it takes to rot timber."

Mr. S. Crossman, of Ann Arbor, Mich., writes the journal above quoted as follows:

"I saw in one of your papers not long since an inquiry regarding the best time to cut timber. The answer named two periods, and one was June—the poorest time of all the year. Sixty years' experience prompts me to risk this statement: The best time is September, after the sap has returned to the root."

To which the *Post and Tribune* replies:

"When our correspondent has lived another sixty years, he will find that we were right in our answer. We said in June and February; our correspondent says in September. He does not differ with us so far as that month is concerned, although we say February. Is not the sap in the root in February most generally? Now for June. The best time for cutting timber has caused much discussion; but full experiments have shown that it always lasts longest when most rapidly seasoned; this is more especially the case with all the soft and less durable kinds of timber. Basswood rails, cut and split at midsummer, with the bark immediately peeled from the wood, will dry rapidly, and become hard and durable like horn; cut in winter or spring, it dries very slowly, generally becomes sap-rotten, and is of little value."

"William Cone, of this state, [Michigan] wrote some years ago to the *Rural New Yorker*: 'In June, 29 years ago, having need of a pair of bar posts, I had to cut a tree for that purpose. I cut a white oak about two feet through at the butt and split out a pair. The bark peeled off easily. I set them with the butt end in the ground. Now, that pair of posts have outlasted about three sets in others parts of my farm, and the rails split at that time are much better than many that were split many years after. Now, basswood rails split in the summer, when they will peel easily, will outlast ordinary oak cut in the winter.' It is now, in order to hear from our friend of 60 years' experience. No dispute about September; you are right and so are we."

Mr. Andrew Huggins, a veteran engineer and surveyor of Shiawassee County, Mich., in relation to the best time for cutting timber in order to secure its greatest service, says: "Tamarack cut in June or July and peeled never rots." He probably means "hardly ever." He would cut oak in the spring before the leaves were out. He says the Indians always cut hickory for bows and arrows in the summer or before cold weather sets in. Locust, he says, may be cut at any time; that is, he says its durability is not affected by the time of year in which it is cut. Black ash should be cut before the full leaf in the spring, or immediately after the fall of the leaf, in warm weather.

In June, 1844, he cut some tamarack stakes and set them in marshy ground for boundary marks, and they are now sound after standing more than 35 years. A tamarack hitching-post, cut in June, was sound after standing 18 years, and showed no signs of decay. He believes timber is the most durable if cut when it will season or dry rapidly. Mr. Wilber Reynolds, a farmer and cooper and an old resident of Michigan, says of "cooper stuff":

"It makes no difference what time of year it is cut. It is split up thin and the sap wood taken off. It is then cross-piled so that it can season at once, and no rot takes place.

"Workmen are in the Michigan forests the year round manufacturing 'cooper stuff,' much of which lays piled in the roads and on the wharves for years before being worked up or shipped. He has frequently seen culled staves that were made from the trunks of trees and left on the ground, that were perfectly sound when the remaining portions of the trees with the bark on, were far advanced in decay. As to cutting timber for other uses he believes it should be cut in spring, summer or early autumn. He mentions a log house, built of tamarack, the logs for which were cut in June and the bark peeled off. This house has been standing more than 40 years and is yet comparatively sound, while other log structures of tamarack laid up with the bark on decayed in a few years. Of other log buildings, of timber all of one variety, and all cut the

same day, some logs peeled and others not, the peeled logs remained perfectly sound, when those with the bark on were completely rotten."

PROCESS OF GROWTH.

We know of mill-dams that were built 70 years ago of hemlock logs that were cut in June and are as sound now (1880) as when standing. Mud-sills of the same kind of timber, and which were cut at the same time and placed in the foundation of a mill, still remain sound, and there is no end of instances of timber remaining sound under similar circumstances for many years longer than the above-mentioned period. In some sections large quantities of oak and hemlock trees are peeled for tan-bark. This is done in June and July, and in some backward seasons, "well up north," some peeling is done in August. This work is done at this season for the reason that bark cannot be peeled at any other time with profit. In early spring the sap commences its summer work. Starting at the rootlets it commences its circulation by passing upward through the trunk until it reaches the buds at the ends of the twigs. The sap holds in solution all the substances necessary for the growth of the tree to make wood. Among those substances are sugar, starch, potash, tannic and other acids, albumen, etc., etc., necessary for the formation of wood fibre. The substance necessary for the formation of the leaf is carried to the buds, while the manufacture (so to speak) of wood is deposited between the outer layer of bark and the "sap-wood." In cutting through the bark of a tree we find from $\frac{1}{4}$ to 1 in. of soft wood called *albumen* or sap-wood. The thickness of this soft wood varies with the kinds or varieties of timber. After we have cut through the albumen, we come to red or dark colored wood which botanists call *duramen*. This is hard, firm and fully matured. The sap in its course passes through the duramen, thence through the albumen where it is deposited between the outer layer of sap-wood and the bark. As the sap accumulates it forms a slimy, pulpy mass, resembling albumen, a substance of which it is largely composed. It is now, to use a back-woods expression, that "bark peels." This albuminous substance continues to dry and harden as the season advances, until it forms a layer of a leathery consistence varying in thickness from $\frac{1}{8}$ of an inch to $\frac{1}{4}$, and in some varieties $\frac{1}{2}$ of an inch. This forms a layer of inner bark and a layer of albumen and is the work of a year. During the time that this has been done the inner layer of albumen has been hardened and joined to the duramen as finished wood. In the meantime the bark, which was a portion of the sap deposit of the previous year has been added to the sapwood. In this manner a layer or grain of wood is formed each year, and the destructive agents in the sap (substances which cause fermentation after the trees are cut) have been carried to the surface and extremities and there deposited. The little sap remaining in the trunk, after having delivered the material for the year's growth of leaves, bark, wood-fibre, seed, nuts, fruit, etc., as the case may be, is composed mostly of acids and wood spirits, and is comparatively harmless, if kept at a low temperature. But the presence of a small quantity of sap will cause a *dry rot*, when the temperature is high enough to cause a slight fermentation. Dry rot commences at the heart and works outward. This is worse than surface rot in ties, for it cannot readily be detected, and the tie fails suddenly by crushing when its outward appearance indicated a sound tie, whereas a tie that begins to rot on the surface may remain sound for years after becoming "sap-rotten." A tie that has once been thoroughly seasoned may become sap-rotten on the edges and the sap-wood seems to protect the hard wood from decay by keeping it constantly moist, so that sap-rot is no evidence of bodily decay or general rot. Trees that have been pulled for tan-bark become "as hard as horn" after a few days exposure to sun and air, and when made into ties and thoroughly seasoned before being laid, will far outlast ties made under any other circumstances if we except some of the preservative processes.

(TO BE CONTINUED.)

The Georgia State Railroad.

Ten years ago the Legislature leased the Western & Atlantic road for the term of 20 years. One half of that time has expired and the state has received \$3,000,000 in cash from the lessees. The lease has 10 years yet to run, and in that time the state will receive \$3,000,000 more in cash. In the term of the lease it will have paid the enormous sum of \$6,000,000.

It is an essential part of this lease that the road shall be run with absolute impartiality, and the humblest citizen has the right to test the impartiality of its management in the courts. It is also "written in the bond" that the road shall be returned at the end of the lease in as good condition as it was when first leased—the state being put under no expense for repairs. It will be seen, therefore, that we have a square income of \$300,000 a year, without a dollar of outlay, subject to no contingency and without any depreciation of the property. A safer investment no state ever made—a better investment Georgia cannot make.

Aside from the fact that the state should control in the interest of all sections and all classes this most important railroad within her borders—the key, as it were, to its entire system of roads—as a purely financial matter, the road should never be sold. It could never bring, at any sale, more than \$5,000,000, and most probably not bring over \$3,000,000. The chances are that the few men rich enough to make a serious bid for the road would pool their bids, and carry it off for less than \$3,000,000. But if it were to bring \$5,000,000, we should be throwing up what now pays 6 per cent. on that sum. The state is floating 4 per cent. now and to change an investment that is paying 6 per cent., and not impairing the property and fully protecting the public rights, would be a criminal blunder. We have no idea that any serious attempt will ever be made to sell this valuable property. If such an attempt is ever made the *Constitution* will oppose such a plan with all its soul and strength, and before every tribunal.—*Atlanta (Ga.) Constitution*.

THE SCRAP HEAP.

Prizes at the Australian Exhibition.

At the International Exhibition at Sydney there were 223 American exhibitors, and these received in the aggregate 288 awards. There are five degrees of merit indicated by the awards, as follows: 1. first degree of merit, special; 2. first degree of merit; 3. highly commended; 4. commended; 5. honorably mentioned. Among the American exhibitors receiving rewards are the following:

First degree of merit, special.—H. Dieston & Sons, Philadelphia; Oliver Ames & Sons, North Easton, Mass.; Russell & Erwin Manufacturing Co., New Britain, Conn.; American Watch Co., Waltham, Mass.; Fairbanks & Co., St. Johnsbury, Vt.; Edge Moor Iron Co., Wilmington, Del.; J. A. Fay & Co., Cincinnati; William Sellers & Co., Philadelphia.

First degree of merit.—F. S. Pease, Buffalo, N. Y.; Stanley Rule and Level Co., New Britain, Conn.; Yale Lock Manufacturing Co., Russell & Erwin Manufacturing Co., William Sellers & Co., Philadelphia; American Watch Co., Waltham (four awards); Howe Scale Co., Rutland, Vt.; Fairbanks Scale Co., Alhousie Windmill Co., San Francisco; Stow Flexible Shaft Shaft Co., Philadelphia; Eclipse Windmill Co., Beloit, Wis.

Highly commended.—Gardiner & Co., New York; H. W. Johns Manufacturing Co., New York; Hoopes & Townsend, Philadelphia; Washburn & Moen Manufacturing Co., Worcester, Mass.; Ingersoll Rock Drill Co., New York; Tanite Manufacturing Co., Stroudsburg, Pa.

Commended.—Averill Chemical Paint Co., New York.

Honorably mentioned.—First & Fryhill, New York.

Kansas City Railroad Young Men's Christian Association.

The Railroad Young Men's Christian Association, of Kansas City, Mo., issues the following circular giving an account of a new undertaking:

"Through the liberality of railway officials, a free reading room has been opened at 1,036 Union avenue (over Eysell's drug store), under the direction of the Railway Branch of the Young Men's Christian Association. It is intended for the use of those who are connected with the railway service in any capacity—railroad, telegraph, express, postal service, etc.; also for residents of West Kansas, and those connected with factories and business houses located in this part of the city. Strangers and travelers will be heartily welcome.

"The leading daily papers, monthly magazines, illustrated journals, railway publications and religious weeklies will be kept on file. Chequers, chess, etc., can be found in the room.

"Pen, ink, paper and envelopes will be furnished those who desire to write letters.

"The room will be kept open from 8 a. m. to 9:30 p. m. every day except Sunday. The hours for Sunday will be announced.

"The General Secretary or an assistant will be present during the entire day."

Mr. A. B. Garner, Superintendent of the Union Depot, is Chairman of the Association.

A Curious Accident.

Last week a very queer accident occurred in the Pack-Saddle, at a point midway between Bolivar and the Blairsville Intersection. A recent storm in that vicinity had dislodged a large oak tree that stood upon the side of the mountain, which slid down and lodged directly across the track at an angle of about 45 degrees. Engine 486, which is an extra, and run by Anthony Roeloffs, engineer, and W. G. Malone, fireman, was coming along at a high rate of speed, with a heavy train of freight cars behind it, and when the men saw the tree across the track they prepared to jump off. In doing so the fireman broke his arm in two places, while the engineer, who was afraid of injuring himself, got down on the floor of the engine as closely as he could get, while the huge iron horse went crashing through the tree, tearing it apart, and knocking the stack, dome, sand-box, whistle and cab off the engine. After the tree was passed the engineer got up from his unpleasant position and attempted to sound the signal for down brakes, but was unable to do so on account of the machinery being so badly wrecked by passing through the branches of the tree. He then jumped from the engine and waited until the rear end of the train came along, bearded it, and informed the trainmen of the accident, and the brakes were applied and the train stopped, but not before it had run about a mile and a half from the place of the accident, on account of the machinery being severely injured, and the fireman was taken to his home on a western bound train. The engine was brought to this city, and there is nothing left of it but the boiler and tank. The engineer deserves great credit for the manner in which he acted on the occasion.—*Altoona (Pa.) Call*, July 22.

ANNUAL REPORTS.

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Louisville & Nashville.

The Louisville Courier-Journal gives an abstract of the year's earnings of this road and the bonded debt, as it will stand when adjusted. The following are the earnings of the road for the fiscal year ending June 30, earnings for June, 1880, estimated:

	1879-80.	1878-79.
Gross Earnings	\$419,246	\$369,007
Net Earnings	\$150,964	\$112,929
July	444,749	428,991
August	527,214	407,927
September	609,577	455,099
October	697,032	591,370
November	681,811	505,813
December	674,455	450,476
January	575,035	430,637
February	612,593	421,578
March	563,882	396,082
April	635,014	425,750
May	870,000	504,229
June		274,450

Total, 1879-80, \$7,329,613; 1878-79, \$5,387,595. For July, 1879, the mileage was 974 miles; for August, 1879, it was 1,107 miles, the increase being the 135 miles of the Evansville, Henderson & Nashville Division. It remained 1,107 miles until March 1, 1880, when it was increased to 1,287 miles by the 180 miles of the Mobile & Montgomery. For April, 1880, it was 1,318 miles, the increase being 31 miles of the Cumberland & Ohio, Southern Division. For May, 1880, the mileage was increased to 1,561 miles by the St. Louis & Southeastern, 208 miles, and the Owensboro & Nashville, 35 miles, and for June, 1880, it reached 1,702 miles, the addition being the New Orleans & Mobile line, 141 miles.

The Pensacola, the Pensacola & Selma and the Selma-Montgomery line do not appear to be included.

The average mileage for the year was 1,216 miles, making the earnings \$6,028, gross, and \$2,579, net, per mile, against \$5,539, gross, and \$2,295, net, in the fiscal year 1878-79.

The Courier-Journal (which usually speaks of this road from official information) continues: "Having learned now what the resources of the company are, the next step is to know what are its obligations, or what they will be when the present negotiations are carried to a successful conclusion."

"The proceeds of the mortgage for \$20,000,000 will be used up paying the floating debt; in paying for the recent acquisitions of the company, and in redeeming bonds which are falling due during the next 20 years. The new mortgage bears 6 per cent. interest; the bonds which they are to replace bear 7 per cent. interest. When this mortgage is placed and the other bonds canceled, the debt of the company will be as follows:

Character of indebtedness	Rate of interest	Amount	Total interest
New mortgage	6	\$20,000,000	\$1,200,000
City of Louisville (no mortgage)	6	850,000	51,000
Memphis & Ohio (mort.)	7	3,500,000	245,000
Memphis & Clarksville (mort.)	6	2,270,700	136,242
Cecilian Branch (mort.)	7	1,000,000	70,000
Nashville & Decatur (mort.)	7	1,900,000	133,000
Nashville (state indorsement)	6	190,500	11,430
Nashville stock (div. guar.)	6	1,400,000	84,000
S. & N. Alabama (mort.)	6	5,010,000	300,603
S. & N. Alabama (state indorsed)	8	391,000	31,280
New Orleans & Mobile Division	6	5,000,000	300,000

Total, \$41,512,250; \$2,562,555. "This statement shows the entire indebtedness of the company, by comparing the last annual report with the papers filed with the mortgage, and it may be received as entirely trustworthy. It embraces 1,702 miles of road, which during the year will, by the completion of lines under contract, be increased to 1,840 miles of road. From a comparison of these two tables it is seen that after paying interest and fixed charges there will remain a surplus of \$1,400,000."

Central Vermont.

This company, for the first time in its corporate existence, has furnished to *Poor's Manual* some statements of its operations for the year 1879. As its only previous statements have been the very vague and useless ones made biennially to the Vermont Railroad Commissioners, some figures from the last report may be of interest.

The company operates, as trustee and receiver the Vermont Central Railroad from Windsor to Essex Junction, 111 miles, and the Vermont & Canada road, which extends from Burlington to Rouses Point, 55 miles, with a branch from Swanton Junction to Province Line, 10 miles, making 65 miles in all. It works under leases or other agreements the Sullivan County road from Windsor to Bellows Falls, 26 miles; the Rutland road, from Bellows Falls to Burlington, 120 miles; the Addison road from Leicester Junction, Vt., to Ticonderoga, N. Y., 15½ miles; the Montpelier & White River, from Montpelier to Barre, 6 miles; the Montreal & Vermont Junction, from Province Line to St. Johns, P. Q., 26 miles; the Stanstead, Shefford & Chambly, from St. Johns, P. Q., to Waterloo, 40½ miles, making in all 234 miles thus worked, and, with the two roads held as trustee and receiver, 410 miles in all.

The company also works the New London Northern road, from New London to Brattleboro, 121½ miles, but its earnings are reported separately.

It is not necessary or possible to attempt here any explanation of the very complicated litigation from which this company originated. It is singular in this, that it does not own any of the road which it operates, except that, we believe, it holds all the stock interest of the Stanstead, Shefford & Chambly road.

The equipment consists of 109 engines; 57 passenger and 44 baggage, mail and express cars; 1,305 box, 95 stock, 40 coal and 527 flat cars; 57 service cars.

The stock of the Central Vermont Company was fixed at \$2,000,000. The bonded debt upon which it is liable for interest consists of \$3,000,000 Vermont Central first mortgage; \$1,500,000 Vermont Central second mortgage; \$1,500,000 Vermont Central Trusts' equipment bonds; \$1,500,000 Vermont & Canada bonds; \$444,100 Stanstead, Shefford & Chambly purchase bonds; \$1,508,600 income and extension bonds of the trust; in all, \$9,452,700. There were also \$500,000 Mississippi Railroad bonds, but that road is now held by the trustees for the benefit of its bondholders.

The traffic of the whole system for the year was as follows:

Train mileage, freight	806,336
" " passenger	1,525,475
" " service	67,114
Total	2,398,925
Passengers carried	648,184
Passenger mileage	17,314,875
Tons freight carried	1,204,637
Tonnage mileage	148,070,474
Average passenger train load, number	21.47
" " freight	97.07
Average rate per passenger per mile	3.91 cts.
" " ton	1.00 "

No comparisons can be made on account of the lack of figures for previous years. The earnings for the year were as follows:

Passengers	\$677,180.25
Freight	1,588,364.30
Mail and express	90,371.75
Miscellaneous	97,338.72

Total (\$2,010.40 per mile) \$2,464,264.02

Expenses (69.34 per cent.) 1,708,757.32

Net earnings (\$1,842.70 per mile) \$755,506.70

The average rate per ton per mile is low for a New England road, but on some of its lines this company carries a considerable traffic in through freight received from the Grand Trunk for Boston and other New England points.

No statement of the disposition of net earnings is given. The yearly charge upon the bonds named above is \$706,775, which, if paid, would leave a surplus of only \$48,731.70 to be disposed of. There is also the rental of the Rutland Railroad to be paid, and some charges on other lines.

Alabama Great Southern.

This road, formerly the Alabama & Chattanooga, extends from Chattanooga, Tenn., to Meridian, Miss., 290 miles. It is owned by an English company. A report published in London by the directors gives the following statements:

"In 1879 the gross earnings of the road were \$441,181, as compared with \$332,006 in 1878. In 1877 the earnings averaged \$900 per mile per annum; in 1878 \$1,135 per mile; in 1879 \$1,500 per mile; and the monthly statements up to March 31 of the current year indicate that at least \$2,000 per mile may be expected. The directors have constantly kept in view the absolute necessity of improving the permanent way, keeping the rolling stock up to the requirements of the increasing traffic, securing the efficiency of the local staff, and generally raising the service to a high standard. The accounts of the American Company show a balance to the credit of net revenue of \$32,221, or \$6,637, which includes the balance of \$31,867, or \$6,557, brought forward on Dec. 31, 1878. The balance sheet of the English Company shows that the current expenses in England from the formation of the company to Dec. 31, 1879, chargeable against profits amount to £3,883. Deducting this sum from the balance to the credit of the net revenue account of the American Company, there remains a balance of £2,746.

"On Dec. 31, 1878, the outstanding claims, of which a considerable portion was disputed and in suspense, amounted to \$814,546, or £167,602. During the year 1879 the amount was reduced to \$522,076, or £107,423, and during the current year it has been further reduced by the acquisition of receivers' certificates to \$379,734, or £78,134. The directors hope that during the ensuing session of the Circuit Court in June further progress in this direction will be made. The amount of the company's bonds held in trust for the purpose of meeting these claims is \$388,000.

"Up to the present time the company's trains have used the track of the Nashville & Chattanooga for the five miles between Wauhatchie and the terminus at Chattanooga. The business of the Alabama Great Southern has, however, now reached a point that makes existing arrangements altogether insufficient, and the directors are of opinion that the road should have independent access to Chattanooga. With this view, they have ordered the necessary surveys and estimates, preparatory to an early commencement of the work. The amount required to complete the five miles of new line will be comparatively large, as the nature of the country involves a tunnel of some 1,200 yards in length, besides other heavy engineering works."

Troy & Greenfield.

This road, which includes the Hoosac Tunnel and is owned by the State of Massachusetts, extends from Greenfield, Mass., to the New York state line, 49.77 miles. Of this 6.17 miles, from the New York line across a corner of Vermont to the Massachusetts line, is worked by the Troy & Boston Company under a lease. The same company runs its trains to North Adams 6.60 miles, and the Fitchburg Company runs its trains from Greenfield to North Adams 37 miles, both paying tolls on the business done. These were the only companies doing business over the road during the last fiscal year, but the Boston, Hoosac Tunnel & Western has since made a connection at the Massachusetts line, and the New Haven & Northampton and the Massachusetts Central expect to make connection from the east during the current year. The road is held open to all connecting lines at equal rates.

The revenues of the line for the year ending Sept. 30 were as follows:

	From Fitchburg	From Troy & Boston	Total
Passengers	\$41,067.07	\$11,409.41	\$52,476.48
Freight	125,810.80	27,445.40	153,256.20
Mail, etc.	5,506.16	1,126.30	6,632.46

Total, \$172,384.03; \$39,981.11; \$212,365.14

Rent of Southern Vt. section, 12,000.00

Total, \$224,365.14

Expenses, \$88,449.89

Extra repairs, wash-outs and land-slides, 18,370.01

Net earnings, \$117,545.24

Improvements and additions, 42,832.97

Net balance, \$74,712.27

Of the receipts as given above, however, the sum of \$34,750.75 was retained by the Fitchburg Company subject to the result of an arbitration with the state as to the amount of tolls to be paid.

The state maintains the road, but does not pay the cost of moving passenger or freight trains, that being done by the companies using the road.

The total amount of earnings over the road was \$258,576.05 by the Fitchburg Company, and \$59,971.06 by the Troy & Boston, a total of \$318,547.11, a slight increase over the previous year. The traffic for six months ending Sept. 30 was as follows:

	East	West	Total
Loaded cars moved	27,020	8,802	35,822
Empty	635	18,540	19,175

Total, 27,555; 27,402; 54,957. Passengers carried, 26,113; 34,429; 60,542. Passenger mileage, 709,527; 705,936; 1,415,463. Tons freight carried, 333,757; 46,035; 379,792. Tonnage mileage, 13,371,316; 1,677,373; 15,048,689.

The great bulk of the business was through traffic, the

local traffic being comparatively small. During the six months 1,118 passenger, 2,909 freight and 675 gravel and construction trains passed through the tunnel, a total of 4,702 trains, being an average of 28.6 per day.

The report enumerates a number of needed improvements and additions to the property, most of which are now being made.

Minneapolis & St. Louis.

This company's report covers the year 1879, during which it worked a line from Minneapolis, Minn., to Albert Lea, 108 miles, with the Minneapolis & Duluth Branch, from Minneapolis to White Bear Lake, 15 miles. Just before the close of the year an extension from Albert Lea to Forest City, Ia., 35 miles, was completed, and by purchase and construction a line from Ft. Dodge, Ia., to Livermore, 29 miles, was acquired. Since the close of the year the gap has been closed, and the company now has a continuous line from Minneapolis to Ft. Dodge, 210 miles.

The equipment consists of 16 engines, 6 passenger and 3 baggage cars, 207 box, 6 stock, 65 flat and 9 caboose cars.

The general account is as follows:

Stock	\$2,000,000.00
Bonds	1,405,000.00
Floating debt, bills payable	325,817.62
Current accounts and balances	73,076.52
Income account, balance	96,279.99

Total, \$3,900,174.13

Construction, \$3,797,457.12

Miscellaneous accounts, 79,463.55

Cash, materials and receivable, 23,250.46

3,900,174.13

The construction balance sheets show that the extension from Albert Lea to Livermore had cost to the end of the year \$444,915.49, and the line from Ft. Dodge to Livermore \$213,327.91. The total bonded debt authorized (now, we believe, all issued) is \$280,000 Minneapolis & Duluth bonds; \$455,000 on the old line from Minneapolis to Merriam Junction; \$950,000 on the extension from Merriam to Albert Lea, and \$1,020,000 on the extension from Albert Lea to Ft. Dodge, a total of \$2,705,000, or \$12,022 per mile, with a yearly charge of \$189,350, or \$842 per mile.

The earnings for the year were as follows, mileage for the two years substantially the same:

	1879.	1878.	Inc. or Dec.	P. c.
Passengers	\$86,954.39	\$86,939.44	I.	\$14.95
Freight	372,507.31	303,816.34	I.	68,690.97 22.6
Mail and express	11,883.20	14,479.44	D.	2,596.24 17.9

Total, \$471,344.90; \$405,235.22; I. \$66,109.68 16.3

Expenses, 284,704.83; 266,568.50; I. 18,136.33 6.8

Net earnings, \$186,640.07; \$138,666.72; I. \$47,973.35 34.6

Gross earn. per mile, 3,832.06; 3,294.00; I. 537.46 16.3

Net earn. per mile, 1,517.40; 1,127.37; I. 390.03 34.6

Per cent. of expens., 60.42; 65.78; D. 5.36 8.1

Payments of interest on bonds and floating debt amounted to \$162,854.49, leaving a surplus from net earnings of \$23,785.58 to be carried to income account.

The traffic for the year was as follows:

Train mileage, passenger	122,532
Train mileage, freight	177,096
Train mileage, switching and service	157,113

Total, 456,741

Passengers carried, 81,067

Passenger mileage, 2,701,000

Tons freight carried, 330,253

Tonnage mileage, 10,042,653

Average passenger train load, number, 22.05

Average freight train load, tons, 107.52

Average rate per passenger per mile, 3.170 cts.

Average rate per ton per mile, 1.955 "

The earnings per train mile were 111.462 cents; expenses, 67.326; net, 44.136 cents. The cost of locomotive service was 16.55 cents per mile run; of maintenance of way 10.28 cents per train mile.

Of the passenger mileage 56.6 per cent. was of local passengers. Of the tonnage mileage 76.9 per cent. was of business to or from other roads; 54 per cent. was of south-bound, and 46 per cent. of north-bound freight. The average rate per ton per mile on through freight was 1.587 cents; local, 3.169 cents.

There were 1,265,872 barrels of flour made in Minneapolis in 1879, and of this 630,058 barrels—very nearly half—were shipped over this road.

During the year 86 tons iron rails and 20,586 new ties were laid, and 25 tons of steel rails laid in the Minneapolis yard. There was one truss bridge and 900 feet of trestle rebuilt, and 1,440 feet of trestle filled in. A good deal of new fence was built. So much of the road has been built within two years or so, that renewals are pretty light as yet.

The completion of the Ft. Dodge extension is expected to add considerably to the freight business in coal from the mines about Ft. Dodge, and in lumber carried from Minneapolis to the Iowa end of the road.

Burlington, Cedar Rapids & Northern.

This company works the following lines:

	Miles.
Main line, Burlington, Ia., to Albert Lea, Minn.	252
Pacific Division, Lin. Ia., to Postville	94
Pacific Division, Vinton, Ia., to Holland	48
Muscatine Division, Muscatine, Ia., to Wabash, Mo.	77
Iowa City Division, Elmira, Ia., to Iowa Junction	21

Total, 492

The track from Manly Junction to Northwood, 11 miles, is owned by the Central Iowa Railway, and operated in conjunction with that railway. The track from the state line to Albert Lea, 12½ miles, is owned by the Minneapolis & St. Louis Railway Company, and is leased to this company for a term of 999 years.

The following statements have been published for the year ending June 30, 1880.

The stock and debt remained unchanged, and are as follows:

Stock (\$11,179 per mile)	\$5,500,000
First mortgage 5 per cent. bonds (\$13,212 per mile)	6,500,000
Minn. & St. Louis 7 per cent. bonds assumed	150,000

Total, \$12,150,000

The yearly interest charge is \$335,500, or \$782 per mile.

The earnings for the year were as follows:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Gross earnings	\$1,863,472	\$1,387,961	I.	\$475,511 34.2
Expenses	1,184,804	950,658	I.	234,206 24.6

Net earnings, \$678,668; \$437,303; I. \$241,365 55.2

Gross earn. per mile, 3,788; 3,191; I. 597 18.7

Net " " " 1,379; 1,065; I. 314 37.2

Per cent. of expens., 63.58; 68.49; D. 4.91 7.2

The mileage worked in 1878-79 was 435 miles. The net earnings last year as shown above were \$343,108 greater than the yearly charge upon the bonded debt, this surplus being equivalent to over 6 per cent. upon the stock. There is, however, to be deducted therefrom \$43,315 yearly charges upon the extension of the Muscatine Division Extension, which would leave \$299,793 as the real surplus.



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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

BURNING BITUMINOUS COAL IN LOCOMOTIVES.

Probably as much time and ingenuity have been expended on the problem of burning bituminous coal without smoke in locomotives as upon any other one connected with railroad operation. Up to the present time, unless some recent contrivances are more successful than those which preceded them, it must be admitted that all the efforts in this direction have been almost fruitless. At any rate the various plans that have been tried have been abandoned, and with the exception of the deflector over the furnace-door, which is much used in Europe, all the various plans that have been devised have been abandoned, and now only the "plain" fire-box, as it is called, is used in this country.

The theory of the combustion of coal is quite simple, and is well understood by all those who are interested in the subject and have any respectable knowledge of science. The difficulty is solely in putting the theory into practice. Although this theory is fully elucidated in different books, it is sometimes a good plan to re-examine knowledge of this kind, and therefore it is proposed to make a somewhat elementary statement of the principles of combustion, in order to throw some light on practical experience.

Average bituminous coal contains about 80 per cent. of carbon, 5 per cent. of hydrogen and 15 per cent. of other substances, usually regarded as impurities. When a shovel-full of such coal, weighing say 10 lbs., is thrown into the fire-box of a locomotive, and is heated to about 1,200 degrees, the 5 per cent. of hydrogen unites with three times its weight of carbon and thus 20 per cent. of the coal is converted into carburetted hydrogen, which is nearly the same as ordinary coal illuminating gas. In heating this coal to the temperature named, 2,300 units of heat are absorbed from the fire by the coal, and in the process of gasification, as it is called, a still further amount of heat is absorbed and becomes latent, or apparently disappears. The first effect of putting fresh coal on the fire then is to cool it. If, however, the temperature is

high enough to light the gas as it escapes from the coal, and if a sufficient quantity of air is supplied to the gas, it will take fire and then burn like an ordinary gas jet, or like the jets of gas which escape from lumps of coal in an ordinary grate fire. If we examine either of them very carefully, though, it will be seen that the lower portion of the flame is of a blue color. This is due to the combustion of the hydrogen, which has a greater affinity for oxygen than carbon has. As the latter element never exists separately in a gaseous state, as soon as the hydrogen is burnt out of the gas, the carbon, which is one of the constituents, if left alone assumes a solid form, or that of a fine powder, and thus produces smoke. If at the time that the combustion of the hydrogen occurs a sufficient quantity of air is supplied to the flame, the solid carbon powder or smoke will be burned in a continuous series of bright flashes of each distinct particle of that element, and it is this combustion which gives to flame its bright light. If there be not enough air there will be no incandescence of a part or all of this solid carbon, and it will pass off in the form of smoke. Now let us see what the amount of the waste will be from this cause. As stated above, the gas which is generated from coal consists of 5 per cent. of hydrogen, which unites with 15 per cent. of carbon. If all of the latter in the gas escaped unconsumed, or in the form of smoke, the waste could not exceed 15 per cent. That only a portion of this carbon escapes in the form of smoke is indicated by the bright flame which is always seen in a fire-box when bituminous coal is burned actively. This flame is due to the combustion of a part or all of the carbon referred to. The proportion which is consumed in this way and that which escapes in the form of smoke of course depend upon the more or less perfect character of the combustion; but under any circumstances, the waste due to smoke can be only a fraction, and probably a small one, of 15 per cent. of the fuel. The reason for the disappointment in the economy effected by smoke-consuming appliances is thus apparent. As a matter of fact, the waste of fuel from the production of smoke is comparatively small, and usually the means provided for preventing smoke incur as much loss in some other way as the saving they effect.

After the carburetted hydrogen is all expelled from the coal, the remainder is coke, which, with the exception of the impurities in the coal, is nearly pure carbon. This coke burns almost without flame and in two different ways. If a comparatively small quantity of air is admitted to the fire, 8 parts of oxygen will combine with 6 parts of carbon and form carbonic oxide. The combustion in this way of one pound of carbon will produce 4,400 units of heat. But if double the quantity of air is supplied, 16 parts of oxygen will unite with the 6 parts of carbon and thus produce carbonic dioxide, or carbonic acid as it was formerly called. The combustion of one pound of carbon will then yield 14,000 units of heat, or more than three times that which is produced by the other form of combustion.

An adequate supply of air is therefore required to prevent smoke, and also to effect the most perfect combustion of the coal or coke after the gas is expelled from it. The mistake usually made is that of confusing these two results. A proper supply of air to a fire will, it is true, prevent smoke, and also effect a most important saving, but only a very small portion of the latter is due to the prevention of the smoke. A very high degree of economy might be attained and at the same time produce great volumes of smoke. It is of course desirable for other reasons to prevent smoke, but an important step would be gained if the idea that smoke prevention means economy could be entirely eliminated. Of course a very high, in fact the highest, economy can only be effected when smoke is entirely consumed, but the principal cause of waste in locomotive fire-boxes is due not to the production of smoke but to other sources.

The difficulty of supplying just the right quantity of air to the fire of a locomotive is very great. There is, in the first place, the great diversity in the quality of fuel, no two kinds of which act in the same way on a grate while they are burning. Therefore different kinds of grates are needed for the various qualities of coal. It is evident, too, that the quantity of air which will pass through the layer of coal on a grate will depend very much on the way the fireman manages it. There is the great difficulty, too, that the rate of combustion in a locomotive must vary through such a very wide range. Sometimes the fire must be forced to its utmost limits, and at other times it can remain in a state of comparative quiescence. At one time the layer of coal will be a few inches and at others it will be a few feet thick. There is, of course, the self-regulating effect of the blast.

That is, when the engine is working hard and is consuming a great deal of steam, the blast is strong in proportion to the work done, and consequently, the draft is regulated somewhat by the working of the engine, but it must be seen that the quantity of air which will pass through the crevices of a layer of coal which is constantly varying in quantity and in form must be very far from uniform or proportional to the rate of combustion. If too little air is supplied, there will be imperfect combustion, and if too much enters the fire-box, its temperature is reduced and its efficiency diminished. When it is necessary to generate the greatest possible quantity of steam in a given time, it is of the utmost importance that the temperature of the fire-box should be kept as high as possible. The effect of admitting too much air is shown if the furnace-door is opened, even for a short distance. All the air not needed to promote combustion is then an injury instead of an advantage. It would seem to follow from this that the admission of air to the fire-box should, as far as possible, be capable of being regulated. The blast of the engine in a measure regulates the admission through the grate, and skillful firing will also do much to adjust the supply to the demand, but to admit air above the fire without any means of increasing or diminishing the supply is, to say the least, unscientific, and it can be said further that in nearly all cases when this has been done it has caused more harm than good. Generally it will be found that whenever firemen are left to themselves they will close up the openings for admitting air above the fire, as they find, and say, that they can make more steam when they are closed than when they are open. Probably the firemen are right. Altogether the most effective means of admitting air above the fire is through the furnace door, with a hood or deflector over the latter on the inside. The plan is very generally used in Europe, and the fact of its coming into general use there or anywhere indicates its usefulness.

The direction in which there seems to be the most hope of improvement in burning bituminous coal is simply in improving the proportions of the fire-boxes and the grates to the work which they must do. What is much needed is some form of construction which will permit the fire-box to be made wider, and thus give more room for the processes of combustion to be carried on. Having secured this, the next thing would be to proportion the grates to the fuel to be burned and the work to be done. This is a very inviting field for research, and probably would be a very profitable one to railroad companies.

EXPORTS, IMPORTS AND INVESTMENTS.

The report of United States exports and imports, which has recently been published by the Bureau of Statistics for the past 21 years, is an extremely important and suggestive document, which deserves study and consideration by all who are interested in the progress of the country and of its commerce.

The course of domestic exports was downward from the year ending with June, 1860 (when they were \$316,250,000), till 1865, when they had fallen to \$137,000,000; in that time the resources of the country were absorbed by the war, and cotton, our most valuable export, was shut out from the world's markets. In 1865-1866 the exports jumped at once to \$337,500,000, or 147 per cent., cotton exports at high prices after the war making this fiscal year exceptional, as the next year there was a falling off of more than one-sixth in export values. In the years (ending with June) 1867, 1868 and 1869, the variations were trifling from \$275,000,000. Then came an increase of \$100,000,000, and a constant increase till \$569,400,000 was reached in 1874—a year of exceptionally large grain exports at exceptionally high prices. The effect of the panic on exports was not nearly so great as on production in general, and though they fell off \$70,000,000 in 1875, they began rising immediately again, in 1876 were larger than ever before except in 1874, and since that time have continued to increase without interruption, the \$824,100,000 of exports in the fiscal year ending with last June, being 18 per cent. more than in 1879, 21 more than in 1878, 40 more than in 1877, 57 more than in 1876, and 65 per cent. more than in 1875.

The variations in imports have by no means been the same. These fell from \$353,600,000 in 1860 to the minimum of \$189,360,000 in 1862, a decrease of 47 per cent. in two years. Thence they fluctuated between \$238,750,000 in 1865 and \$434,800,000 in 1868 until 1867-68, when, beginning with \$357,500,000 they increased constantly from year to year until 1873, when they reached \$642,100,000. Then began a rapid downward movement, which continued until 1877-8, when the imports were but \$487,000,000, the decline, however, being much greater in values

than in quantities, as prices of all manufactured goods had fallen greatly in this time. Though there was a turn in the tide after 1878, it was but just perceptible in 1879, the increase being but two per cent.; but in the last fiscal year it has come with a vengeance, the aggregate imports reaching \$667,900,000, which is more than in 1873 even, and \$222,000,000, or 50 per cent., more than last year. Such a tremendous increase in the purchases of the country, almost wholly of manufactured goods, in a year, too, when we know that there has been a very great increase in the production of domestic manufactures—a change from extreme depression to decided and general activity in most branches of manufacturing—indicates a vast and sudden increase in the disposition to purchase for consumption and for use in new productive enterprises. It would hardly be correct to say that it argues a corresponding increase in wealth and purchasing power. The country has been getting rich for years, but its savings have largely gone to pay its foreign debts. We were making these debts with great rapidity before 1874, and from 1860 to 1875 inclusive there were but two years when the values of imports did not exceed the values of exports, and in those sixteen years the aggregate excess of imports over exports was \$1,175,609,561, the difference, doubtless, being met by government, state and railroad bonds. But since 1875, within the past five years, this course has been reversed, and the aggregate excess of exports over imports has been the enormous sum of \$921,179,834. Now this represents approximately what this country can spare for making purchases abroad and paying interest on the debts we owe there. There have been some expressions of anxiety because the excess of exports has been a good deal less in the last year than in the two just preceding. But this we think is a healthful indication rather than the contrary. We must do something with our credit balances. So long as American securities were very cheap, the interest on their market value therefore very high, and the opportunities for more profitable investment at home scanty, the best thing we could do with these balances was to buy American securities with them—that is, pay our foreign debts; and this, doubtless, we did do to a very great extent, and were so much the richer for it. But it is now evident that we have paid off most of these debts which foreign investors are willing to have paid (that is, to sell at prices which will yield a rate of interest satisfactory to Americans), and now we have to use our balances to buy something else with. We cannot invest to advantage abroad, and the result is we have to take merchandise for what is owed us.

Doubtless, recently, we have somewhat increased our foreign debts, by the sale of American securities, such as the New York Central stock marketed by the London syndicate, and a few issues of railroad bonds issued mostly by reorganized companies which are chiefly controlled in Europe, and doubtless these operations have had something to do with stimulating imports, but as even last year the exports exceeded the imports by \$170,000,000, their effect is not needed to explain the great growth in the imports of merchandise.

However, the margin of exports over imports has become pretty narrow of late months, and if the tendency keeps on it will disappear entirely within a year, and if so we will be paying the interest on our foreign debts largely from the proceeds of securities that we sell abroad. This is usually looked upon as bad financiering and evidence of national extravagance. That depends, however, on what we do with the money we borrow. If we invest it in productive enterprises, earning profits greater than the interest on the capital invested in them, it makes no difference how much we borrow nor how much more the cost of imports of materials for such profitable productive enterprises exceeds the value of our exports. Borrow a thousand millions at 6 per cent. to build an Isthmus canal say, which will come to South America chiefly in the shape of imports of materials and supplies. If the canal yields a profit of 10 per cent. the country will get rich by such a debt. It is true that in this country profitable expenditures on new works cannot have been made long without increasing production and exports—otherwise they would not be profitable. But it is not capital borrowed and imports made for such investments—for “productive consumption”—that are likely to bring the country to trouble, but imports or other expenditures for “unproductive consumption.” The thing that we need to bear in mind, however, is that materials used in a canal or a railroad or factory may be consumed unproductively just as much as champagne or diamonds. They always are when the service which the structure performs does not increase the aggregate national wealth, and cases of the kind are extremely common, and

were especially so in this country before 1874. And in spite of the warning given by the financial ruin and general distress since that time, we are not at all unlikely, within a few years, to waste our resources in a similar way on a large scale—constructing public works of great cost that either are not needed at all, or that will not be needed for years to come. The temptation to this course is the profit to be made in the simple construction of railroads, which has often been very great, even where there is very little prospect of immediate profit from the operation of the roads, and which leads to the organization and financing of companies solely for the purpose of getting profits from contracts for the construction and materials of their roads. Fortunately the revival of railroad construction in this country this year shows few traces of the revival of this policy. By far the larger number of roads are being constructed by responsible companies already owning profitable railroads, whose proprietors and managers have much at stake in the success of their new lines and extensions, and have the experience which should enable them to form correct judgments, both as to the place where and the time when they are needed. That they may make mistakes, and that doubtless some of them will, is to be expected; but that as a general thing the vast system of lines now under construction is believed by its projectors to be needed, needed now, and to be likely to be profitable very soon, is undeniable. The danger of wasteful investments (from which the whole world suffers, and not the investors alone) will be much greater a little later, when a considerable period of prosperity and financial healthfulness shall have led the average investor to become careless, and to believe that there can be no end to the good times, and when the rapid accumulation of capital shall have made it more difficult to place investments in securities of well proved value.

A SHIP CANAL FROM CHICAGO TO THE MISSISSIPPI.

The Illinois & Michigan Canal is the subject of a report just published by a committee appointed by a convention held in Ottawa, Ill., last March, to prepare an address to the people of the State of Illinois and to Congress, upon the question of the canal and river improvement, and also a bill for the same. It does not clearly appear from the address now published just what this committee would have done. It speaks of such an improvement that lake vessels and Mississippi steamers may pass between Chicago and St. Louis, but vessels of what tonnage or draft it does not say, and the results to commerce as well as the cost of the work itself would vary immensely with the capacity of the vessels for which passage was given. It also speaks of the improved channels as if it would be the outlet for all the agricultural produce west of the Mississippi, but does not specify as one of the improvements required a westward extension of the canal to the Mississippi; yet a ship canal to St. Louis would hardly secure one-fourth of the tonnage that one to a point on the Mississippi nearly due west of Chicago would command. Indeed, the address is mainly a setting forth of the vast amount of produce of the Northwest, the rapidity of its increase, and the great advantage of cheap transportation, against which there is nothing to be said. At first sight it might appear that a canal from Chicago to the Mississippi might have a value similar to that of the Erie Canal, as connecting a great water route with cheap deep-water navigation. But the shortest rail distance from New York to Buffalo is 423 miles; from Chicago to the Mississippi it is but 135 miles, or but one-third as far. Any collection of produce by boats on the Mississippi and its tributaries that could be made for a canal to the Mississippi, can be made to-day at Clinton, Iowa, and for the aggregate trans-Mississippi produce much cheaper (at least with shorter rail hauls) to Clinton than to St. Louis or the mouth of the Illinois, and cheaper even than to the mouth of a canal as far north as Rock Island. The question then is whether a canal which would eliminate a rail haul of 140 miles and one transfer from boat to rail would save enough to pay. It must be remembered that the freight must be delivered by rail to the river boats somewhere, and that there are no tributaries of the upper Mississippi west of that stream which have any steamboat traffic now worth mentioning, although there is a great deal produced along them which the railroads get satisfactory rates for carrying. The boats that would pass through the improved canal, therefore, would have to pick up their freight at various Mississippi River points from St. Paul to St. Louis where the railroads brought it from the West.

Again, the saving of freights that can be made is much less east of the Mississippi than west of it, and,

as we have seen, the canal could carry and affect rates only for the distance from the Mississippi to Chicago. All places south of Rock Island now have trunk-line rates on through rail shipments—the lowest rail rates known in the world. And as to the roads entering Chicago from points further north, it may be said, as indeed of all the roads entering Chicago from the west, that the tendency is constantly toward a reduction in their through grain rates, and probably the time is not far distant when their rates from the Mississippi to Chicago will be little, if any, higher per ton per mile than trunk-line rates; and it is hardly probable that even a steam canal could compete successfully at these rates, except with that one road parallel with which it might be. That is, if its Mississippi terminus was at Alton, it might compete successfully with the line between Chicago and St. Louis, but probably not with those between Burlington, Rock Island, Clinton, Dubuque, McGregor and Lacrosse, not to say St. Paul, and Chicago.

Nevertheless, there is no doubt that a good water connection between Chicago and St. Louis would be a good thing for a considerable part of the country, though perhaps of little value to the larger part of the Northwest in behalf of which its construction is urged. Whether it would be worth what it would cost is another question which very likely deserves serious inquiry. Toward the answer to this question the committee whose address we have mentioned contributes scarcely any evidence. First of all is required what we may call a traffic survey, which will establish as nearly as possible the amount, course and actual rates paid by the existing and prospective traffic, the extent to which different parts of this traffic might be diverted to an improved water-way, and the saving likely to be affected at different water rates. Next in importance, but of course just as indispensable before undertaking any work of construction, would be the survey and plans for water-ways of different degrees of capacity, and trustworthy estimates of the cost of transportation by each. It might well happen that a channel for 500-ton boats would pay where one for 2,000-ton steamers would not.

If the commerce between Chicago and the lake country with the South were one-fourth as great as their commerce with the East, there would be much greater reason for supposing this project advantageous. And there are certain uses for a water-way between Chicago and St. Louis which are little spoken of, and yet might be of more importance than those which are most enlarged upon. There is some reason to suppose that with very cheap transportation this line might become the seat of vast iron and other manufactures. With the Lake Superior iron ore cheaply accessible at one end, the Iron Mountain ores close to the other, and abundant coal (though of inferior quality for iron-working) directly on and close to the line, this seems exceptionally well situated for those manufactures whose raw materials and products are heavy in proportion to their value. In Chicago and St. Louis, and on the railroad between them, are now all the Bessemer works west of Cleveland, and most of the rail mills, and, as the census of this year shows unmistakably, it is the manufacturing industries and population that are increasing in Illinois, the agricultural population being almost stationary, and, in many counties, having actually decreased.

The time may have been when the introduction of a competing canal to the Mississippi would have materially reduced the profits of several Chicago roads; but the effect would be very much less now, partly because these roads now make comparatively small profits on what traffic a canal could divert, partly because they very generally own their own connections west of the Mississippi and to a considerable extent can control the destination of traffic over them, but chiefly because the profits of the parts of their roads east of the Mississippi (which alone would be affected by a canal) now come chiefly from local traffic, from passengers, and from the more valuable freights which the canal would not attract by low rates. These parts of the Chicago roads are approximating the trunk lines out of New York more and more yearly in the nature, extent and value of their traffic, except that their local traffic grows faster. They carry an immense through traffic at low rates and reap a moderate profit from it, and a great deal is said about that, as it alone usually can be diverted from one route to another. But their chief dependence is on a local traffic which cannot easily be taken from them; in this resembling to a limited extent the New York Central, which with canal or river competition at almost every station makes magnificent profits at very low rates from an enormous local traffic, which keeps up its dividends even in those years when the tremendous through traffic pays little or nothing more than expenses.

Atlantic Grain Receipts.

Receipts of grain (not including flour) at each of the Atlantic ports for the six months from Jan. 1 to June 26 have been:

	1876.	1877.	1878.	1879.	1880.
New York...	30,495,653	19,924,306	46,093,509	47,544,225	53,783,541
Boston.....	6,014,457	6,715,583	8,401,080	9,497,938	10,427,509
Portland.....	1,448,042	7,727,703	1,411,821	1,881,579	1,560,701
Montreal.....	4,458,554	2,675,282	3,751,777	3,658,213	4,250,142
Philadelphia.....	15,980,850	8,917,040	19,777,810	23,033,029	22,396,710
Baltimore.....	15,483,324	14,213,084	17,846,500	21,412,959	21,000,218
New Orleans.....	3,611,173	4,511,487	7,597,048	6,708,693	10,581,535

Total..... 77,491,653 56,063,575 107,920,955 115,927,223 124,068,465

The total receipts of the seven ports, thus, were this year 7 per cent. more than last year, 15 per cent. more than in 1878, 121½ per cent. more than in 1877, and 60 per cent. more than in 1876. The aggregate amount of increase since last year being 8,100,000 bushels, we find that New York has gained 6,240,000; Boston, 930,000; Portland, 580,000; Montreal, 640,000; and New Orleans, 3,780,000; while Philadelphia has lost 665,000 and Baltimore, 3,360,000—the losses of the last two somewhat exceeding New Orleans' gain.

The percentage of the total received at each port was:

	1876.	1877.	1878.	1879.	1880.
New York.....	30.3	35.5	45.5	41.0	43.3
Boston.....	7.8	10.2	7.8	8.2	8.4
Portland.....	1.9	1.3	1.3	0.8	1.3
Montreal.....	5.7	4.8	3.5	3.2	3.5
Philadelphia.....	20.6	14.8	18.3	19.9	18.0
Baltimore.....	20.0	25.4	16.6	21.0	17.6
New Orleans.....	4.7	8.0	7.0	5.9	8.5

Total..... 100.0 100.0 100.0 100.0 100.0

The percentages of the total receipts at New York compared with those of Philadelphia and Baltimore taken together have been:

	1876.	1877.	1878.	1879.	1880.
New York.....	30.3	35.5	45.5	41.0	43.3
Philadelphia and Baltimore.....	40.6	40.2	34.9	40.9	35.6

The three cities..... 70.9 75.7 80.4 81.9 78.3

New York's percentage was largest in 1878, but next to that has been largest this year. The percentage of the other two cities is this year nearly the smallest for five years.

Comparing New York and Boston, taken together, with Philadelphia and Baltimore, taken together, we have:

	1876.	1877.	1878.	1879.	1880.
New York and Boston.....	47.1	45.7	53.3	49.2	51.7
Philadelphia and Baltimore.....	40.6	40.2	34.9	40.9	35.6

The four cities..... 87.7 85.9 88.2 90.1 87.3

Last year the two northern cities received about one-fifth more, this year nearly one-half more than the two southern ones. Putting it in quantities, New York and Boston received 9,600,000 bushels more than Philadelphia and Baltimore, and this year 22,790,000 bushels more—largely due, as we showed last week, to the earlier opening of navigation this year, which favors New York especially.

Going back to the first table of percentages, we find that New York's was larger this year than in any other of the five except 1878; Boston's largest this year; Portland's largest in 1876, but much larger this year than last; Montreal's was smaller only last year, Philadelphia's smaller only in 1877, Baltimore's smaller only in 1878, and New Orleans' largest this year, but not much larger than in 1877.

The chief peculiarities of this year have been the decided increase at New Orleans and the early opening of lake and canal navigation.

The heavy receipts of new wheat at Baltimore, which began about the middle of July, are likely soon to modify somewhat these percentages, especially if the upward movement of lake and canal rates continues. The southern ports, however, have had the advantage of comparatively high water rates throughout this season. That they have not profited more from it is doubtless due to the fact that rail rates also have been higher than for several years, so that New York still could be reached cheaper than any other Eastern port.

It being nearly time for the July reports to come in, further discussion of the distribution of grain among the Atlantic ports is postponed.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Denver & Rio Grande.—Track has been laid on the Manitou Branch, from Colorado Springs, Col., to Manitou, 6 miles. Gauge, 3 feet.

Missouri, Kansas & Texas.—The *Denison Division* is extended from Whitewright, Tex., southeast to Leonard, 10 miles.

Missouri, Iowa & Nebraska.—The *Centerville, Moravia & Albia Branch* is extended from Moravia, Ia., north to Albia, 14 miles, completing the line.

Nashville & Florence.—The first track is laid from Columbia, Tenn., west by south to Mount Pleasant, 11 miles.

Burlington & Missouri River in Nebraska.—The *Republican Valley Division* is extended eastward to Hardy, Neb., 3 miles.

Chicago, St. Paul, Minneapolis & Omaha.—The *Northern Division* (the former *North Wisconsin road*) is extended to Chandler, 10 miles. A branch of the *Eastern Division* is completed from Menomonee Station, Wis., to Menomonee, 2 miles.

Southern Pacific.—Extended from San Pedro Crossing, Arizona, eastward 14 miles.

Detroit, Mackinac & Marquette.—Extended to a point twenty miles east by south from Marquette, Mich., 4 miles.

Pennsylvania.—The track of the *Pittsburgh Virginia & Charleston Branch* is extended from Monongahela City, Pa., east by south to Maple Creek, 6 miles.

Chicago, Milwaukee & St. Paul.—The *Elk Point Cut-off* is

completed from Elk Point, Dak., to the Sioux Falls line, 6 miles.

Chicago, Rock Island & Pacific.—The *Guthrie Branch* is completed from Guthrie Junction, Ia., north by east to Guthrie Centre, 14 miles.

This is a total of 101 miles of new railroad, making 2,525 miles thus far this year, against 1,187 miles reported at the same time in 1879, 941 in 1878, 830 miles in 1877, 1,046 miles in 1876, 594 miles in 1875, 913 miles in 1874, 1,996 miles in 1873, and 3,372 miles in 1872.

FAST TRAINS have attracted so much attention in this country of late that a statement of the best work of this kind that is being done in England now will be interesting. Correspondents of the *English Mechanic* say that considerable improvement in the speed of trains has been made there this year. On the Great Northern Railway there are now eight trains daily running between London (King's Cross) and Grantham, 105½ miles, without stopping or picking up water, in 123 to 128 minutes each, or at the rates of 49½ to 51½ miles per hour. From Grantham to Doncaster, on the same road, trains run the 50½ miles in 61 minutes; from Grantham to Wakefield, 73 miles, one train runs in 77 minutes, or at the rate of 56½ miles per hour, and the last-named train runs a distance of 186½ miles in 215 minutes, excluding stops—an average speed while running of 52.05 miles per hour. The famous "Flying Dutchman," London to Exeter, makes 193 miles in 225 minutes, and stands 20 minutes at stopping places, its average speed while running being 49½ miles per hour. Six of the eight fast trains on the Great Northern are drawn by engines with one pair of 8-ft. drivers; two by engines with four wheels connected. The Grantham-Wakefield run is claimed to be the fastest regular train run in the world. The statement we have quoted gives the distance as 73 miles, and the average rate of speed 56½ miles per hour; another statement makes the distance 70½ miles, which reduces the average speed to 54½ miles per hour, at which rate it would take about 98 minutes to run from New York (Jersey City) to Philadelphia, with no stop on the road, which the fastest train now makes in 110 minutes. But there are three stops made on this line, and none on the English run.

WATER RATES have fluctuated but little during the past week. Lake rates closed Wednesday at 4½ cents a bushel for corn and 5½ for wheat for Chicago or Milwaukee to Buffalo—a slight advance. Canal rates are quoted at 5½ cents for corn and 5½ for wheat from Buffalo to New York—Ocean rates nearly throughout the week have been 9½d. per bushel for grain by steam from New York to Liverpool, once reaching 9½d. These unusually high rates, however, at last began to check exports, and Wednesday the demand for vessels was hardly equal to the supply, so that there is some prospect of a reduction, which, in view of the low prices for grain, is desirable. It now costs about 12½ cents a bushel to send wheat by water from Chicago to New York, and 19½ cents to send it from New York to Liverpool, which is probably about inversely in proportion to the cost. There is some reason to suppose that the rates will be higher in midsummer this year than later. There seems to be rather a scant supply abroad to last till the new crop comes forward, which makes large shipments now imperative; but the harvests of Europe are likely to be so much better than last year, that after they are gathered there will be much less urgency for a large movement, and though we will have as much to export as last year, and may export all the surplus, we are not likely to do it if the rates for transportation are very high. This will have some effect on internal as well as ocean transportation, doubtless; but it is only ocean transportation that is now exceptionally high.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends have been declared as follows:
Illinois Central, 3 per cent., semi-annual, payable Sept. 1.
New York, Providence & Boston, 2 per cent., quarterly, payable Aug. 10.

Kansas City, Ft. Scott & Gulf, 3½ per cent. upon the shares represented by contracts to issue preferred stock, payable Aug. 16. These contracts represent a part of the former bonded debt, and this is the first dividend.

Detroit, Lansing & Northern, 3½ per cent. on the preferred, and 2½ per cent. on the common stock, payable Aug. 10.

Cheshire, 1½ per cent. on the preferred stock, payable July 28.

Car Trust of Pennsylvania, 2 per cent., quarterly, payable Aug. 2.

Railway Equipment Trust of Pennsylvania, 1½ per cent., quarterly, payable Aug. 2.

Delaware & Bound Brook (leased to Philadelphia & Reading), 1½ per cent., quarterly, payable Aug. 2.

Pullman Palace Car Co., 2 per cent., quarterly, payable Aug. 16.

Middlesex Central (leased to Boston & Lowell), 3 per cent., semi-annual, payable Aug. 2.

Chicago & Alton, 3½ per cent., semi-annual, payable Sept. 4. Transfer books will be closed from Aug. 24 to Sept. 6. This dividend will apply to the new issue of common stock, provided full payment for the same has been made on or before Aug. 20.

Foreclosure Sales.

The *Atlantic, Mississippi & Ohio* road will be sold in Richmond, Va., Nov. 1, by Mr. F. Pleasant, Master, under a decree of the United States Circuit Court foreclosing the consolidated mortgage. The sale will include the entire property of the company, the road from Norfolk, Va., to Bristol, Tenn., 408 miles; the branches to City Point, 10 miles, and to Salt Works, 10 miles; 428 miles of railroad in all, with all equipment and appurtenances. The bonded

debt consists of \$5,101,094 sectional bonds, subject to which the road will be sold, and \$5,470,000 consolidated bonds. A plan of reorganization has been agreed on, as heretofore noted.

Western Railway Weighing Association.

A meeting of representatives of the roads entering Chicago from the West was held in that city, July 27, for the purpose of perfecting a plan for a more satisfactory weighing of car-load freight on all lines. There were present W. C. Swan, Chicago, Milwaukee & St. Paul; C. G. Eddy, Chicago & Northwestern; Paul Morton, Chicago, Burlington & Quincy; J. T. Sanford, Chicago, Rock Island & Pacific; James Smith, Chicago & Alton; Horace Tucker, Illinois Central, and Robert Forsythe, Chicago & Eastern Illinois.

After the matter had been fully discussed and considered, it was resolved to organize the Western Railway Weighing Association, the object of which shall be to have all car-load freight weighed at the initial points. The following Executive Committee was elected: W. J. Swan, E. P. Ripley, J. T. Sanford, H. C. Wicker and Horace Tucker, this Committee to serve for the term of one year.

The Committee then elected Horace Tucker Chairman. Mr. J. R. Wheeler, who for some years past has had charge of the weighing for the Southwestern lumber pool, was elected Superintendent of the organization, with power to appoint weighmasters at the various stations and points of shipment.

The agreement was signed by the following roads: Chicago & Alton; Chicago, Burlington & Quincy; Chicago & Eastern Illinois; Chicago & Northwestern; Chicago, Milwaukee & St. Paul; Chicago, Rock Island & Pacific; Illinois Central, and Wabash, St. Louis & Pacific.

It was decided to put the new arrangement in force Aug. 16. It was also decided to issue the following call:

"Pursuant to agreement a convention of railroads located west of Pittsburgh and Buffalo and east of the Mississippi River will be held at the Kennard House, Cleveland, Wednesday, Aug. 4, at 11 a. m. The business to be transacted will be to consider and adopt such measures as will insure the collection of charges on all car-load freight on the basis of the actual weight carried. To promote this result all roads between Buffalo and the Mississippi River should participate in the movement. Assurances from 25 roads have been received that they will be represented. Earnest invitation is hereby extended to all others within the territory described to be present at the time and place above named."

ELECTIONS AND APPOINTMENTS.

Alabama Great Southern.—At a recent meeting of the board, Mr. John Scott, heretofore Assistant General Manager, was appointed Agent and General Manager, to date from Aug. 1.

Baltimore & Chicago.—At a called meeting of the stockholders in Wooster, O., July 27, the following directors were chosen: K. F. Randolph, Columbiana County, O.; Lewis Scott, Waynesburg, O.; James Evans, Bolivar, O.; S. P. Beales, Wayne County, O.; D. D. Miller, R. P. Reddick, Wooster, O.; W. Cheserun, Jeromeville, O.; David Whiting, Ashland, O.; Casper Schwartz, Ashland County, O.; W. B. Cuykendall, Plymouth, O.; J. R. Straughan, Ft. Wayne, Ind.; George A. Kelley, W. E. Schmetz, Pittsburgh, Pa. The board elected D. D. Miller, President; George Plummer, Secretary; J. O. Jennings, Treasurer; J. R. Straughan, Chief Engineer.

Brunswick & Albany.—Col. Chas. L. Schlatter, heretofore Chief Engineer and General Superintendent, has been appointed General Manager and Treasurer. Mr. R. D. Meader, heretofore Assistant Superintendent, has been appointed Superintendent.

Carolina Central.—The office of General Manager will not be filled for the present. It is said that Gen. McRae will probably not accept the position.

Mr. James Anderson has been chosen Treasurer. Mr. F. W. Clark is appointed General Freight and Passenger Agent.

Chicago, Milwaukee & St. Paul.—Mr. T. W. Wadsworth has been appointed General Land Commissioner. He has been for a number of years in the company's service.

Fond du Lac, Amboy & Peoria.—Mr. B. H. O'Meara has been appointed General Freight Agent of this road.

Ft. Wayne & Jackson.—The following circular is dated July 31:

"Mr. H. A. Raymond, Auditor and Purchasing Agent of this company, having resigned, to take effect this day, those positions are hereby discontinued.

"Communications relative to purchase, and car mileage reports, will hereafter be addressed to the General Superintendent (Mr. M. D. Woodford).

"Mr. J. C. Webb has been appointed Freight and Ticket Accountant. All ticket reports, freight statements, way bill tissues, etc., will, in future, be addressed to him at Jackson, Mich."

Galveston, Harrisburg & San Antonio.—Mr. S. L. Werden is Chief Clerk in the General Superintendent's office at Houston, Texas.

Grand Rapids, Greenville & Bay City.—This company was last week organized by the election of the following directors: Wm. Backus, C. J. Church, C. C. Ellsworth, George F. Middleton, Leroy Moore, John M. Riddle, Eugene Rutan, Nathaniel Slaght, Stephen R. Stevens, James Towles, Greenville, Mich.; J. M. Barnett, H. J. Hollister, W. O. Hughart, Grand Rapids, Mich. The board elected W. O. Hughart, President; C. J. Church, Vice-President; J. H. P. Hughart, Secretary; Leroy Moore, Treasurer. Mr. Hughart is president of the Grand Rapids & Indiana Company.

Gulf, Colorado & Santa Fe.—Mr. C. L. Leslie has been appointed Master of Transportation, and Mr. W. H. Martin Foreman of Car Repairs. Offices in Galveston, Texas.

Indianapolis, Decatur & Springfield.—Mr. E. H. Goodrich is appointed General Superintendent, in place of H. G. Morse, resigned. Mr. Goodrich was formerly on the Chicago, Milwaukee & St. Paul road.

Lehigh Valley.—Mr. A. W. Stedman has been appointed Principal Assistant Engineer of this road and its controlled lines, the Pennsylvania & New York and the Geneva, Ithaca & Sayre. All assistant engineers will report to Mr. Stedman and receive their orders from him. His office will be at Wilkesbarre, Pa., until further notice.

Louisville & Nashville.—Mr. A. Anderson has been appointed General Ticket Agent of the New Orleans, Mobile & Texas Division, in place of J. W. Coleman, resigned.

Middlesex Central.—At the annual meeting in Boston, July 31, the following were chosen: Nathan Carruth, Nathan Cushing, Jacob Edwards, Wm. H. Hill, Jr., George Keyes, S. W. Richardson, directors; Charles B. Dodd, Clerk and Treasurer. The road is leased to the Boston & Lowell.

Missouri, Iowa & Nebraska.—Mr. W. S. Hill, General

Freight and Passenger Agent, has been appointed Assistant Superintendent also.

Nevada Central.—Mr. Joseph Collett is now General Manager, and F. W. Dunn Assistant Superintendent.

New Castle & Franklin.—Mr. A. Vandivort (previously Superintendent) has been appointed Receiver by the Court of Common Pleas of Lawrence County, Pa., to date from July 15. He has appointed F. E. Nettleton Auditor.

Philadelphia, Wilmington & Baltimore.—The board has chosen Nathaniel Thayer, Jr., of Boston, a director in place of Nathaniel Thayer, resigned.

Richmond & Allegheny.—Mr. Decatur Axtell has been appointed General Manager. He is charged with a thorough organization of the company's forces.

Rutland.—At the annual meeting in Rutland, July 29, the following directors were chosen: John B. Page, Rutland, Vt.; B. B. Smalley, James W. Hickok, Burlington, Vt.; James H. Williams, Bellows Falls, Vt.; E. A. Birchard, Brandon, Vt.; George W. Gill, Worcester, Mass.; Jacob Edwards, Edward S. Moseley, Henry M. Whitney, Boston. The board re-elected John B. Page President; James H. Williams, Clerk; Joel M. Haven, Treasurer.

Sioux City & Dakota.—At a meeting held in Sioux City, Ia., July 29, Messrs. S. S. Merrill, J. W. Cary, P. M. Meyers, and W. C. Van Horn were chosen directors in place of C. G. Wicker, E. C. Larned, James C. Blair and John I. Blair, resigned. The new directors are all connected with the Chicago, Milwaukee & St. Paul. The board elected S. S. Merrill, President; J. W. Cary and C. M. Meyers, Vice-Presidents.

Syracuse, Chenango & New York.—Mr. Alfred Allen has been appointed Superintendent. He has been connected with the road for several years.

Utica, Rhaca & Elmira.—Mr. G. James Rice, President of this company, will act also as Superintendent. Mr. J. Roddoun has retired from the office of General Manager, but continues Vice-President.

Western & Atlantic.—Mr. W. A. Anderson has been appointed Ticket Auditor, in place of T. H. Bell, resigned.

Western Counties.—The officers are as follows: President, George B. Doane; Secretary, James W. Bingay; General Superintendent, James Brignell. Offices at Yarmouth, Nova Scotia.

Wichita, MacPherson & Denver.—The directors of this new company are: S. E. Jocelyn, H. W. Lewis, John Tucker, W. S. White, W. C. Woodman. Office at Wichita, Kansas.

PERSONAL.

—Mr. H. G. Morse has resigned his position as General Superintendent of the Indianapolis, Decatur & Springfield Railroad.

—Mr. Thomas L. Ogden, President of the Delaware River Railroad Company, died at his residence at Ogden Station, N. J., July 30.

—Mr. H. A. Raymond has resigned his position as Auditor and Purchasing Agent of the Ft. Wayne & Jackson Railroad, on account of ill health. His retirement is much regretted by the managers of the road, who esteemed him as a faithful and efficient officer.

—Mr. Nathaniel Thayer, of Boston, for many years a director of the Philadelphia, Wilmington & Baltimore, has resigned on account of his advanced age and his desire to be relieved from business cares. Mr. Thayer is a large owner of Western railroad property.

—Mr. Frank Ellmaker recently resigned his office as Chief Engineer of the Springfield Southern Railroad to accept a position in the engineering department of the Pennsylvania Railroad at Altoona, Pa. Before leaving his old road, Mr. Ellmaker was presented by the employees with a valuable gold watch and diamond stud.

—Mr. Walter Clapp, who died at his home in Norwich, Conn., July 27, aged 74 years, was said to be the oldest railroad conductor in the state. He was appointed conductor on the Norwich & Worcester road in January, 1845, and ran regularly on that road nearly 32 years, until October, 1876, when he retired on account of failing health.

—The Boston Transcript says: "Although one of the oldest roads in the country, we doubt if there is another that has as young a set of officers as the Boston & Albany Railroad, the President being only 46; Assistant to the President, 43; Treasurer, 47; Superintendent, 45; General Freight Agent, 30; Assistant General Freight Agent, 45; General Passenger Agent, 38, and Master Mechanic, 47 years old."

—Mr. Merwin Prindle, who died in Indianapolis, July 27, was born in St. Albans, Vt., in 1806, and went to Indiana in 1836. He built a large part of the old Madison & Indianapolis road and was its Superintendent for several years. He afterward had contracts on the Terre Haute & Indianapolis, the Evansville & Crawfordsville and other roads, and from 1854 to 1865 was Superintendent of the Union Depot in Indianapolis. He then built the Cincinnati & Martinsville road and owned a large mill in Madison, but retired from active business several years ago.

—Major John E. Simpson, General Manager of the Terre Haute & Indianapolis Railroad (the Vandalia Line), died at the Lindell Hotel, in St. Louis, Aug. 2, after only a week's illness, of paralysis. Major Simpson was only 40 years old. He was born in New York State, but went to Indiana at an early age. His whole active life had been passed in the service of the Terre Haute & Indianapolis Company, which he entered as a messenger boy, rising gradually through the grades of telegraph operator, train dispatcher, Assistant Superintendent, and Superintendent, to be General Manager. His continuous service was broken only during the war, when he entered an Indiana regiment, in which he rose to be Major. He was very highly esteemed as a manager, and was especially noted for his extreme care and conscientiousness in the performance of his duties.

TRAFFIC AND EARNINGS.

Grain Movement.

For the week ending July 24 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year.	Northwestern Receipts.		Atlantic Receipts.	
	Total.	P. c.	Total.	P. c.
1874.....	3,680,886	2,201,940	434,716	19.7
1875.....	4,424,392	3,698,180	970,152	26.4
1876.....	2,983,881	2,494,710	1,038,209	41.5
1877.....	3,151,091	3,123,145	318,848	10.2
1878.....	4,705,172	3,652,063	1,338,719	36.7
1879.....	4,871,503	3,190,422	1,545,265	30.0
1880.....	7,826,850	6,559,054	1,529,180	23.3

The receipts of Northwestern markets show an increase of

more than 2,000,000 bushels and 34½ per cent. over those of the previous week, and have been exceeded but twice this year, but once last year, four times in 1878, and never before that. So heavy a movement so early in the year was never known before. It is doubtless largely caused by arrivals of new winter wheat, but not wholly so, for more than half the receipts are corn.

The shipments of these markets are 22 per cent. more than in the previous week, and are the largest for four weeks, and much larger than ever were made in a July week before. The rail shipments were a third larger than the week before, and about as large as in the corresponding week of last year. Rail shipments were at no time very large after June last year.

The receipts of Atlantic ports are truly enormous, and have been exceeded but once—four weeks before.

Of the receipts of Northwestern markets, Chicago had 49 per cent., St. Louis 22.2, Toledo 17.6, Peoria 5.1, Cleveland 2.2, Milwaukee 2, Duluth 1.1, and Detroit 0.8 per cent. The receipts of St. Louis and Toledo are chiefly wheat; those of Chicago are four-fifths corn, and it received 77 per cent. of all the corn, but only 14½ per cent. of the wheat.

Of the receipts at Atlantic ports New York had 52.3 per cent., Baltimore 23.6, Philadelphia 11.9, New Orleans 5, Montreal 4.3, Boston 2.7, and Portland 0.2 per cent. Baltimore's receipts are the largest ever known, but New York's have been exceeded once, and its proportion of the whole is the largest for six weeks.

Exports of grain and flour from Atlantic ports for four weeks have been:

	July 28.	July 21.	July 14.	July 7.
Flour, bbls.....	63,647	79,175	101,505	103,177
Grain, bush.....	6,205,071	6,160,354	6,261,017	5,761,139

These are very large exports in grain, amounting to about three-fourths of the Atlantic receipts for the same, which latter have been among the largest ever known.

Buffalo receipts and shipments for the week ending July 28 were:

	Receipts.		Shipments.	
	1880.	1879.	1880.	1879.
By water.....	2,410,800	2,141,285	2,744,050	1,952,231
By rail.....	1,301,000	1,192,200	2,383,900	1,630,038
Total.....	3,711,800	3,333,485	5,127,950	3,582,269

Of the receipts 35 per cent. this year and 35½ last year were by rail, and of the shipments, 40½ per cent. this year and 45½ last year. The rail shipments have increased 46 per cent. and the canal shipments 41 per cent.

Baltimore grain receipts in July were as follows, flour in barrels and grain in bushels:

	1880.	1879.	Inc. or Dec.	P. c.
Flour.....	75,613	78,431	D. 2,818	3.6
Wheat.....	6,960,060	5,122,055	I. 1,837,144	35.9
Corn.....	901,005	1,263,007	D. 362,002	23.9
Other grain.....	71,000	116,000	D. 45,000	39.1
Total grain.....	7,993,073	6,503,021	I. 1,489,452	22.9

Total, flour reduced to wheat..... 8,371,138 6,895,776 I. 1,475,362 21.4

For the seven months ending July 31 the receipts were as follows:

	1880.	1879.	Dec.	P. c.
Flour, barrels.....	614,075	694,525	80,450	11.6
Grain, bushels.....	30,012,739	23,355,279	2,342,540	7.2
Total, bushels.....	33,083,114	23,827,904	2,744,790	7.7

Exports in July were 30,728 barrels and 2,870 sacks of flour, and 6,067,712 bushels grain.

The Buffalo Commercial Advertiser reports grain receipts at that city up to May 31 as follows, flour in barrels and grain in bushels:

	Flour.		Grain.	
	1880.	1879.	1880.	1879.
By lake.....	531,324	312,736	52,817,169	22,458,128
By rail.....	539,900	737,300	19,510,900	25,063,000
Total.....	1,065,224	1,050,036	72,328,069	47,521,128
Per ct. by rail.....	50.1	70.2	27.0	52.7

Shipments eastward of grain received by lake for the same period were as follows, in bushels:

	1880.	1879.	Increase.	P. c.
By canal.....	33,442,647	15,860,333	17,582,314	110.9
By rail.....	16,455,925	5,130,168	11,325,757	220.8
Total.....	49,898,572	20,990,501	28,908,071	137.7
Per ct. by rail.....	33.0	24.4	8.6

The canal opened April 20 this year and May 8 last year.

Railroad Earnings.

Earnings for the various periods are reported as follows:

Six months ending June 30:				
	1880.	1879.	Inc. or Dec.	P. c.
At., Miss. & Ohio.....	\$902,514	\$715,486	I. \$187,028	26.1
Del. & Hudson.....	2,383,094	1,886,694	I. 496,400	26.4
Leased lines.....	965,692	729,418	I. 236,274	34.0
Houston & Texas.....	1,460,833	1,202,074	I. 258,159	21.5
Net earnings.....	465,008	336,561	I. 128,447	38.1
Five months ending May 31:				
Wisconsin Central.....	\$440,017	\$322,646	I. \$117,371	38.2
Net earnings.....	101,909	55,222	I. 46,687	90.4
Month of June:				
Albany & Susquehanna.....	\$110,934	\$80,926	I. \$30,008	37.1
At., Miss. & Ohio.....	133,764	102,247	I. 31,517	30.8
Chic. & Sandusky.....	61,882	51,875	I. 10,007	19.2
Del. & Hudson, Pa. Div.....	76,608	107,094	D. 31,386	29.1
Houston & Tex. Central.....	195,329	163,798	I. 31,531	19.3
N. Y. & Canada.....	50,228	33,301	I. 16,927	50.8
N. Y., Penna. & Ohio.....	364,109	301,272	I. 62,837	20.8
N. Y. & New England.....	219,891	169,116	I. 50,775	30.0
Net earnings.....	83,108	31,374	I. 51,734	164.7
Rensselaer & Saratoga.....	148,325	118,769	I. 29,556	24.9
St. John & Maine.....	7,650	8,957	D. 1,307	11.6
Net earnings.....	351
Month of July:				
Denver & Rio Grande.....	\$372,190	\$80,072	I. \$286,118	332.3
Peoria, Decatur & Evansville.....	43,000
Third week in July:				
Chic. & Eastern Ill.....	\$31,253	\$17,416	I. \$13,837	79.5
Minn. & St. Louis.....	14,588	9,089	I. 5,499	50.5
St. Louis, Iron Mt. & So.....	114,800	88,858	I. 25,942	29.2
Week ending July 16:				
Great Western.....	\$90,878	\$75,193	I. \$15,685	20.8
Week ending July 24:				
Grand Trunk.....	\$203,452	\$154,503	I. \$48,949	31.7

A Southern Railroad War.

There was a report early in the week that the Louisville & Nashville and the Chicago, St. Louis & New Orleans had settled their difficulties. It was untrue, however, and the cutting of passenger rates from New Orleans to northern and

eastern points has continued until it has been impossible to say what the rates really were from day to day. The latest news is that the Louisville & Nashville agents have announced that "special rates on freight will be given on application," which means that the war is to extend to freight as well as to passenger rates.

Coal Movement.

Coal tonnages are reported as follows for the week ending July 24:

	1880.	1879.	Inc. or Dec.	P. c.
Anthracite.....	406,007	552,593	D. 146,586	29.5
Semi-bituminous.....	87,722	92,697	D. 4,975	5.4
Bituminous, Penna.....	42,303	38,643	I. 3,660	9.5
Coke, Penna.....	35,734	27,901	I. 7,833	28.1

The anthracite trade is quiet, but an increased demand is looked for soon, as stocks must be getting low, and the laying in of domestic supplies for winter must soon be begun.

Cumberland and Clearfield production is well maintained, though the market is very quiet with the exception of a slight increase in demand for steamer use.

A Kansas Live Stock War.

A western paper says the roads west of the Missouri River are reported to be fighting bitterly on live stock business. The Kansas City, Lawrence & Southern and the Atchison, Topeka & Santa Fe reached Caldwell, Kan., about the same time, and a severe fight at once began for the stock business from that point. It is stated that both companies were cutting the rate per car, also that the Santa Fe had made a rate from Caldwell to Chicago and St. Louis, via the St. Louis & San Francisco Railroad, of \$75 and \$50, as against \$85 and \$70 by the way of Kansas City via the Santa Fe or Kansas City, Lawrence & Southern. By this cutting the Santa Fe receives \$10 per car for a haul of 50 miles, as against about \$35 for a haul of 279 miles. It was \$10 for a short haul, and so to even matters they made a rate of \$10 from Wichita to Kansas City, hauling a car 279 miles for that amount. This was done to hurt the Kansas City, Lawrence & Southern, and consequently some 300 car-loads, which should have come by way of Kansas City, were shipped by way of St. Louis. The fight is still going on, and Kansas City is complaining that this is hurting its interests.

New York State Canals.

A statement from Albany gives the following figures for the traffic on the canals from the opening to July 31:

	1880.	1879.	Increase.	P. c.
Tons freight cleared.....	2,900,868	2,021,841	879,027	48.4
Miles boats moved.....	5,001,708	2,798,460	2,203,248	78.7
Tolls collected.....	\$534,603.56	\$311,073.77	\$223,529.79	71.9

The canals opened April 20 in 1880, and May 8 in 1879. The average rate per bushel on grain by water from Chicago to New York was: On wheat, 1880, 11.60 cents; 1879, 7.47 cents. On corn, 1880, 10.70 cents; 1879, 6.57 cents.

Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior Region from the opening of navigation up to July 28 were as follows, in tons:

	1880.	1879.	Increase.	P. c.
From L'Anse.....	20,922	16,973	3,949	23.2
From Marquette.....	308,929	244,959	63,970	26.1
From Escanaba.....	532,704	292,587	240,207	82.1
Total.....	862,645	554,519	308,126	55.6

Of the Escanaba shipments this year 262,128 tons came from the Marquette District, and 270,606 tons from the Menominee District. There were also 17,643 tons of ore delivered to local points, making the total output 880,288 tons.

There were 3,173 tons of pig iron shipped from Marquette this season.

Erie Canal.

The business of the Erie Canal at Buffalo from the opening up to July 31 is reported as follows:

	1880.	1879.	Increase.	P. c.
No. boats cleared.....	4,957	2,800	2,157	77.0
Tolls received.....	\$348,064	\$179,134	\$168,930	94.3
Av. receipts per day.....	3,412	2,132	1,280	60.0

The canal opened April 20 in 1880, and May 8 in 1879, giving 18 days more of navigation this year.

RAILROAD LAW.

Liability for Injury to Employees, and Insurance in Germany and France.

In the British Parliament, at present, one of the leading questions regards the adoption of a bill extending the liability of employers for injuries to their employees. In illustration of the matter a very interesting paper has been issued by the government, containing reports on the laws in force in France and Germany with regard to the insurance of persons employed in mines, etc., and the legal liability of employers. As to Germany, an Imperial law, passed June 7, 1871, and extended in 1872 to Alsace-Lorraine, enacts as to railroads "that if any person is killed or hurt in the working of a railroad, the proprietor is liable to damages for the injury inflicted, so far as he cannot prove that such injury was inflicted by a higher power or by the fault of the person so killed or injured." And as to mines and factories, "that any one working a mine or quarry, a pit, or a factory, is liable in damages when death or injury is caused to any person during and in the working of the said mine, quarry, pit, or factory, by the fault of his agent or representative or of any person empowered or deputed by him to direct the work or to superintend the workmen." The amount of damages is assessed by the tribunals, and may be calculated as a total in money or in annuity. In consequence of this law it has become a habit of manufacturers in various parts of Germany to insure the lives of their workmen against accidents incurred within the meaning of the act, and this they do not only by taking policies in existing companies, but by clubbing as manufacturers to form accident insurance societies. In France the principle of the civil liability of employers has no limit, and it is applicable to all kinds of liability. The legislation concerning mines contains special provisions as to workmen, and in the larger number of mines in France mutual assistance and providential funds have been organized in the interest of the workmen. They are, in general, supported by a deduction of 3 per cent. upon the amount of the wages. Railroad companies in France have established for the benefit of their workmen and their employees provident institutions, but they have none the less frequent litigation with persons having sustained damage. The responsibility is fixed by Article 1,384 of the Code Civile, which is as follows: "A person is responsible not only for the injury caused by his own act, but also for that which is caused by the act of persons for whom he is bound to answer, or by things which he has under his care."

Rights of Express Companies.

A dispatch from Indianapolis, July 26, says: "The Louisville, New Albany & Chicago Railroad Company having threatened to eject the Adams Express Company from its line, the Express Company applied to the United States

Court for an injunction, which was granted. On a preliminary hearing of the case in May last, Justice Harlan issued a restraining order until the final hearing of the case. Recently the Railroad Company has annoyed the Express Company in various ways, and finally refused to receive its safes and chests unless the Railroad Company were permitted to open and examine the contents, whereupon the Express Company moved an attachment against the Railroad Company and its various officers for contempt. The greater part of last week was occupied in argument, and to-day Judge Gresham delivered an opinion which is interesting as affecting the transportation interests of the country. He holds that the railroad company and its officers were in contempt, but as they were acting under the advice of counsel he dismisses the attachment at their cost. A railroad company has no right to charge an express company carrying packed parcels the aggregate sum it might charge for parcels if sent separately, but may charge a reasonable rate for the carrying of a safe or chest containing parcels as one single package only. It cannot demand an inspection of the contents of such parcels, unless it has reason to believe the contents to be dangerous to life or property. The decision defines the rights between the parties to be the same as before the suit was commenced, and directs that the status of affairs existing then be maintained until the final hearing.

Tickets as Contracts.

During the recent term of the United States Circuit Court in this city there was tried a case which decided an important question as to the rights of passengers. It was the case of W. C. Bibb vs. the East Tennessee, Virginia & Georgia Railroad. The facts were that Bibb purchased a through ticket from Washington City to Augusta, Ga., containing a plainly printed contract, making it a limited ticket good for one continuous first-class passage, and giving him the right to pass over the defendant's road running from Bristol to Dalton. After leaving Bristol the conductor took from the ticket the coupons over this road from Bristol to Dalton, and handed Bibb what is known as a conductor's check, good for that train only. Bibb, without asking for a stop-over ticket or check, stopped at Knoxville for a day or two, and resumed his journey on the conductor's check. The conductor on this train from Knoxville to Dalton refused to recognize the check given Bibb by the other conductor, as it was good for the other train only; Bibb showed him the through ticket, but it being good for one continuous journey the conductor could not pass Bibb on it without violating the contract and the rules of the company. So he informed Bibb that he must pay his fare or get off. Bibb unfortunately did not have the money with him and when he reached the next station he got off, as requested by the conductor. He borrowed the necessary money, and resumed his trip. His suit was brought against the company for \$5,000 for ejecting him from the train in violation of the contract—Bibb claiming that he made a verbal agreement with the ticket agent in Washington to stop off at Knoxville. The Court held that what the agent stated could not alter the plain contract on the ticket and Bibb was bound by its terms, and having violated it himself by stopping off without the consent of the company he could not claim damages from the road.

Mr. Glenn, of Hopkins & Glenn, represented Bibb. Mr. Shumate, of Dalton, and Messrs. Mynatt & Howell, of Atlanta, represented the road.

The Bibb case shows that purchasers of railroad tickets should understand the importance and effect of the contracts they make with the roads.—*Atlanta (Ga.) Constitution*, July 31.

THE SCRAP HEAP.

Railroad Equipment Notes.

The firm of Bowlers, Maher & Brayton, car-wheel makers of Cleveland, O., has been reorganized, and is now known as Bowler & Co. The shops are full of orders for wheels and other castings.

The Grand Trunk shops in Montreal are now very busy and employ all the men who can be profitably worked. Large extensions are being built to both the car and locomotive shops. A number of new freight engines are being built, and the car shops have in progress several dining cars and a number of freight cars. A new foundry is soon to be built.

The Pittsburgh Locomotive Works lately shipped two engines to the Texas & Pacific, and one to the Atchison, Topeka & Santa Fe.

The Harlan & Hollingsworth Co., at Wilmington, Del., has lately completed several cars for the Woodruff Sleeping Car Co.

The Aurora shops of the Chicago, Burlington & Quincy road are turning out two engines a month.

The Central Iowa shops at Marshalltown, Ia., are to build 200 box cars for use on the road.

Iron and Manufacturing Notes.

The Indianapolis Rolling Mill Co. last week closed a heavy contract for iron rails at \$52 per ton.

At the annual meeting of the North Chicago Rolling Mill Co. last week, the President stated the tonnage of iron and steel produced by the works to be 374,184 tons. The gross receipts for the year ending July 1, 1880, were \$9,172,523.14; the amount of surplus, \$1,342,807. The company has at present 5,000 men in its employ, and the pay-roll for labor for the year just closed amounts to \$1,745,927. The officers chosen were: President, Orrin W. Potter; Vice-President, Samuel P. Burt; Treasurer, Stephen Clement; Secretary, Richard C. Hannah.

The Excelsior Iron Works, in Chicago, are building two winding engines, of 150 horse-power each, for the Union Pacific road. They have a contract for all the steam boilers for the new Pullman shops in Chicago; also heavy orders for the North Chicago Rolling Mill Co. and others.

Mingo Furnace at Steubenville, O., went into blast last week, after a stoppage of several months.

Warren Foundry, at Phillipsburg, N. J., has taken a contract to make 5,000 tons of cast-iron water pipe for the city of Detroit.

The Foster patent rock and ore breaker, made by Totten & Co., of Pittsburgh has been in use six years at the Etina Iron & Nail Works in Bridgeport, O., and is highly recommended by parties who have used it.

Red Bank Furnace, near Red Bank, Pa., is in blast and doing well.

Mahoning Furnace, near Kittanning, Pa., has been thoroughly repaired and is now in full blast.

Bridge Notes.

The Edge Moor Iron Works, near Wilmington, Del., are working double turn. The principal work on hand is for the New York & Brooklyn Bridge and for the Pennsylvania Railroad's new elevated line into Philadelphia.

Messrs. Rust & Coolidge, of Chicago, have the following contracts on hand: Four wrought-iron spans of 215 ft. each and one of 161 ft., over the Mississippi at Sabula, Ia., for the Chicago, Milwaukee & St. Paul; one plate-girder bridge and the car-sheds with iron truss roof for the new depot in

Chicago for the Chicago & Northwestern; two wrought-iron bridges, an iron viaduct across Van Buren street in Chicago and an iron turn-table for the Pittsburgh, Ft. Wayne & Chicago; a wrought-iron, counterbalance draw-bridge at Menasha, Wis., for the Wisconsin Central; six spans of Howe truss for the Wisconsin & Minnesota, and the roof trusses for the Des Moines County Court-House at Burlington, Ia.

Prices of Rails.

Steel rails continue active and prices firm. Philadelphia market reports note sales of some small lots at \$62.50 to \$65 per ton for immediate delivery, but orders for next spring are placed at about \$60 per ton at mill. The makers have plenty of orders on hand and are not pressing for business. New York quotations are nominal at \$56 to \$58.

Iron rails are firmer. Philadelphia quotations are somewhat irregular. A sale of 5,000 tons is reported at \$46 per ton at mill, and \$46.50 to \$47 for heavy sections is generally asked. New York quotations are \$46 to \$48 per ton. A heavy sale is reported from Chattanooga at \$46, net.

Old rails are still unsettled, with little business, buyers offering \$25, while sellers still hold out for \$26 to \$27 per ton. For railroad spikes the Pittsburgh market reports give 2½ cents per pound, 30 days; track-bolts, 4 to 4½ cents per pound, according to kind of nut required; fish-plates, 2½ to 2½ cents per pound.

Test of Iron Roof Trusses.

At the Edge Moor Iron Works, near Wilmington, yesterday an extraordinary test of fabricated iron was made, which will attract the attention of engineers, architects and contractors throughout the country generally, on account of its value as a scientific experiment and of it being now an uncommon occurrence, a similar trial not having taken place in this country probably for years. The test was applied to a Fink truss, a portion of the iron market-house for the city of Georgetown, Demerara. When Mr. Nathaniel McKay, of Philadelphia, was negotiating with the authorities of that British colony, several jealous English and Scotch bidders who were on the ground annoyed him by throwing all sorts of obstructions in his path, going so far even as to pilfer the ideas from his plan. Among other nonsense which they circulated was the libel that the mechanics of the United States could not construct a building of sufficient strength to stand the wear and tear of the tropical climate of Demerara and the occasional wind-storms which visit that latitude. In order to refute this slander, the American bidder expressly stipulated that if the contract were awarded to him he would furnish a test under the supervision of competent engineers, to prove that the roof-trusses were in accordance with the specifications by an actual load of 25 lbs. per square foot. Tests of this character are considered wholly unnecessary and superfluous in this country, and are not made, since by calculation the requisite sections of every member of the roof-truss can be so readily determined. This proviso was placed in the contract, however, and Mr. Charles H. Latrobe, the consulting engineer for the city of Baltimore, and an engineer of some note, was engaged to apply the test.

There were also present yesterday Mr. W. M. Levering, of Wilson Bros. & Co., who drew the plan of the building; Mr. Volmar, of Baltimore, contractor for the corrugated and galvanized iron which will enter into its construction; Mr. George Sellers, superintendent of the Edge Moor iron works, and Mr. McKay. When everything was in readiness the test was applied in the following manner: Two trusses, each having a total span of 55 ft. 1 in. between centres of end-pins, were erected side by side in the yard of the works—in the position which they will occupy in the building—and then loaded with the great burden of 133,000 lbs. of iron, properly distributed at the several points of support, which represented the test-load of 25 lbs. per square foot, and for which the contract stipulated. This was a strain of 9,500 lbs. upon each of the eight panels into which the truss was divided. These trusses were on the Fink system, with a height of 13 ft. 10 in., the total weight of each truss being 4,650 lbs. Under this load the strain was so heavy as to cause two of the ends to sink several inches into the ground and to disturb the plumb. This occurrence was owing to the fact that sufficient bases had not been bestowed, the Messrs. Sellers having been led to understand that a test of only 60,000 lbs. was to be had. Notwithstanding this unexpected disadvantage for the truss, the deflection in the centre was shown to be but half an inch, while not the slightest weakness was found in any of its parts. The test was eminently satisfactory both to the engineer applying it, to the architect, the fabricators and the contractor. This morning a photographic view of the truss, carrying its tremendous load, will be taken, which, together with the certificate of the engineer, will certainly convince the Mayor and the Town Council of Demerara that the test was honestly performed. The market-house is being loaded on a barge now lying at the Edge Moor Works, and which will transport it to Demerara.—*Philadelphia North American*, July 29.

A Runaway Engine.

The Savannah (Ga.) News of July 24 tells the following story of a runaway train, which gathered a crowd in that city:

"Stretched across Liberty street from the track in the yard were four freight cars, the locomotive being inside the yard, but in apparently as demoralized a condition as the train. The trucks of the cars were knocked from under them, and they were canted up beautifully, while the first car, which had executed the novel feat, so to speak, of ploughing through the heavy sand, was pretty badly smashed. This car struck a large tree, one of the row that extends down the middle of Liberty street, uprooting it, and this obstruction, it appears, turned the car from its course, which otherwise would have been directly through the store occupied by Meyer Mendel, on the corner. As it was, the car struck the door and east front of the building, ripping off the weather-boarding as neatly as though the work had been done with an adze, but otherwise not injuring it.

"The brick wall which encloses the Liberty street side of the depot yard, and upon which is built the wooden fence, was smashed down, and the fencing for several panels swept away by the passage of the train.

"So much for the results. Now for the origin of this extraordinary occurrence, which created such general excitement; the wonder being that great loss of life and damage to property had not marked it.

"It appears that the regular schedule freight train on the Savannah, Florida & Western Railway, which left the depot at 1:35 p. m. for the Central Railroad wharves, was running around the curve on the Junction Branch, about a half mile from the main line of the Savannah, Florida & Western Railway, and nearly three miles from the city, where engineer McGee discovered ahead the smoke of an approaching train, which proved to be a delayed Charleston & Savannah Railway train. He immediately reversed his engine to avoid a collision, but quickly perceiving that his efforts were of no avail, and that he was going to be run into, he and the fireman jumped from the engine in order to save their lives.

"The engine being open at the time, the train rattled down the track and into the yard, and, as stated, was only stopped

by the cars breaking through the brick wall on Liberty street. The four cars of the train ran entirely across the street.

"The Charleston & Savannah train sustained damage to the pilot and front of the engine and to bumpers of the car, caused by striking the other engine, which was slightly damaged. Had it not been for engineer McGee reversing his engine before he left her the result of the collision would have been very serious. As, however, the freight train was running away from the Charleston train, the concussion when the latter struck it was not great.

OLD AND NEW ROADS.

Atlantic, Mississippi & Ohio.—The *Commercial and Financial Chronicle* says: "The amended reorganization scheme, which has been adopted by both the English and Dutch committees, differs somewhat from the former plan and the following are its main points:

"At the sale under the proceedings for foreclosure of the mortgage to secure the 7 per cent. consolidated bonds, the Purchasing Committee will be as follows: Sir Henry Whatley Tyler, M. P., John Collinson, Hendrik Jan de Marez Oyens, Charles Smith Seyton, Captain Douglas Galton, R. E. "The position of the divisional securities will remain unchanged, subject, however, to the provisions hereinafter made for acquiring or extending the same. The divisional securities outstanding are approximately as follows:

Norfolk & Petersburg Railroad	\$907,000
South Side Railroad	1,738,500
Virginia & Tennessee Railroad	2,385,500
Miscellaneous—Interest fund notes issued Jan. 1, 1874, 8 per cent.	134,584
Total	\$5,235,674

"Reorganization first-mortgage 6 per cent. bonds: 6,000 of these bonds of \$1,000 each, having 30 years to run, will be created by the new company, and be employed from time to time in acquiring the divisional securities. All the divisional securities so acquired will be held by the trustees of the reorganization first mortgage, in trust, uncancelled, and without their lien being impaired, for the security of the bondholders under such mortgage, and will be canceled when all the divisional securities shall have been so acquired, but not before. If it shall appear to the new company desirable to extend the time for the payment of any divisional securities due or to become due, and to issue new coupon sheets therefor, the new company will have power to do so without prejudice to the lien of the securities extended.

"Reorganization second-mortgage 5 per cent. bonds: The principal of the existing 5,470 issue consolidated 7 per cent. gold bonds will be represented by an equal number of reorganization second-mortgage 5 per cent. bonds of \$1,000 each, having 50 years to run. These bonds, however, will only bear interest at the rate of 4 per cent. per annum until the 1st of April, 1884, and 5 per cent. per annum thereafter, and they will be issued and delivered to the trust company in trust.

"Reorganization 4 per cent. income mortgage bonds: these bonds will be issued and delivered in trust to the trust company for the aggregate of the following amounts:

"1. The overdue and unpaid interest on all the issued consolidated 7 per cent. bonds to the date from which the reorganization second-mortgage bonds commence to run, with 6 per cent. per annum simple interest to the same date on all such overdue interest, and

"2. The difference between the interest secured by all the issued consolidated 7 per cent. gold bonds and the interest secured by the reorganization second-mortgage bonds, capitalized in full from the date when the latter bonds commence to run to Oct. 1, 1901, inclusive.

"Interest will not be cumulative, but payable each year if earned.

"Reorganization stock will be issued and delivered in trust to the trust company for \$547,000, in 5,470 shares of \$100 each. For each \$1,000 consolidated 7 per cent. gold bond, with all coupons belonging thereto, unmaturing at the date from which the reorganization second-mortgage bonds commence to run, there will be delivered \$1,000 reorganization second-mortgage bond and \$100 reorganization stock.

"Additional reorganization income bonds and stock, as well as additional bonds of an inferior rank to the said income bonds, may, if the English and Amsterdam committees shall both deem it expedient so to do, be issued, and may be used for providing the purchase money of the property, or any other sums which they may consider necessary to provide for the purpose of carrying out the scheme.

"The Purchasing Committee may charge the costs and expenses incurred, or to be incurred, in and about this scheme, and not paid in the course of the foreclosure proceedings upon the reorganization second-mortgage bonds, income bonds and stock to be delivered as above. They may also charge, or incur in charging, all or any part of the costs and expenses of the foreclosure proceedings and of all other matters connected with the reorganization upon the first net earnings of the new company after providing for current interest upon the divisional securities and first-mortgage bonds issued and outstanding."

Baltimore & Chicago.—At a meeting of the stockholders of the Ohio Division in Wooster, O., July 28, resolutions were adopted prohibiting the directors about to be elected from entering into any contract binding the stockholders of the company, or incurring any expense not provided for until the entire subscription shall have been obtained and running arrangements secured; also requiring them to submit to the stockholders any proposition, lease or running arrangements that may be proposed for the approval of the company.

Baltimore & Drum Point.—This company announces its intention of resuming work on the road, and has presented a formal claim for the subscription of \$200,000 voted by Anne Arundel County, Md., several years ago. Steps are also to be taken to collect the Calvert County subscription of \$100,000, the state donation of \$134,000, and the unpaid private subscriptions, which amount to \$78,000.

Bangor & Bath.—This company has been organized to build a railroad from Bangor, Pa., southwest by Ficksville and Nazareth to Bath, on the Lehigh & Lackawanna Branch of the New Jersey Central, a distance of about 15 miles. The road would serve several large slate quarries.

Bangor & Piscataquis.—The City Council of Bangor, Me., has voted to accept the offer of Mr. J. H. Pope for the road. He is to pay \$500,000 and agrees to extend the road 12 miles from the present terminus at Blanchard to Moosehead Lake, within three years.

The road is now 63 miles long, from Oldtown, 12½ miles above Bangor, on the European & North American road, to Blanchard. It is chiefly owned by the city of Bangor.

Bedford, Springfield, Owensboro & Bloomfield.—It is said that arrangements are being made to extend this road from Bedford, Ind., eastward to Seymour, about 35 miles.

Bell's Gap.—Work is in progress on the extension of this road from its present terminus at Lloydsville, Pa., to Coal-

port on Clearfield Creek. The distance is 17 miles, through a country abounding in coal and timber.

Boston & New York Air Line.—Under a clause in this company's first mortgage it retained the right to redeem the bonds on six months' notice. The company now gives formal notice that it will redeem said bonds at 105 and accrued interest on presentation at the Treasurer's office, No. 12 Wall street, New York, on or before Feb. 1, 1881. The amount of the bonds is \$500,000, and they bear 7 per cent interest.

Buffalo & Southwestern.—It is announced that an agreement for the lease of this road to the New York, Lake Erie & Western Company has been ratified by the boards of directors of both companies. It will, of course, have to be submitted to the stockholders. The terms of the agreement provide that the rental shall be 35 per cent. of the gross earnings of the leased road, the lessee to pay in all cases the interest on the bonds of the leased road, whether the stipulated proportion of earnings equals the amount of the interest or not. In case the rental should exceed the amount of interest to be paid, the surplus shall be paid over to the lessor company for division among its stockholders.

The Buffalo & Southwestern Company is a reorganization through foreclosure of the Buffalo & Jamestown. The road extends from Buffalo to the New York, Pennsylvania & Ohio road at Jamestown, N. Y., a distance of 67½ miles. The capital stock is \$943,800, and the funded debt authorized, \$1,500,000. The gross earnings for the year ending with September last were \$340,820, and 35 per cent. of this amount would be \$119,290, or \$14,290 more than 7 per cent. interest on the bonds. The net earnings for last year were only \$10,100.

Burlington & Missouri River in Nebraska.—The eastern extension of the Republican Valley Division leaves the main line of that division at Amboy, Neb., three miles east by north from Red Cloud, and not at Red Cloud, although the latter is the division station to and from which trains run. It is now in operation to Hardy, 28 miles eastward from Amboy, and three miles beyond the point last noted.

Central, of New Jersey.—A second track was laid on the Long Branch Division from Long Branch to Shark River, 11 miles, on Sunday, Aug. 1. All preparations had been made previously, but the actual work of laying the track was all done on that day.

Chicago & Eastern Illinois.—This company is about to make extensive additions to its shops in Danville, Ill. The brick for a twenty-stall roundhouse has been contracted for, and the building will be completed in time to shelter the engines from the winter storms. Early next spring a brick building, 200 by 80 ft., will be erected for the iron work. The present machine shops will then be used for the repairing of cars, the present car shops to be turned into paint shops.

Chicago & Northwestern.—A telegram says that work has been begun on the new line from Milwaukee, Wis., to Madison, and the intention is to have cars running before the end of the year.

A dispatch from Brookings, Dak., July 31, says: "The Chicago & Northwestern Railroad Company has decided to connect its Black Hills line of road with Watertown on the main line, by a road from Volga up the Sioux River. Work will be begun at once, and the grade completed and iron laid this way. The distance is 60 miles. The Watertown line will be extended to the James River to a connection with the James River Branch, but this will probably not be done this fall. With the completion of the extension from Tracy to Fort Pierre the Chicago & Northwestern will have a continuous air line from Chicago to the upper Missouri River of 783 miles in length. To reach the Black Hills the company will have to construct only 160 miles more road from Fort Pierre."

Chicago, Milwaukee & St. Paul.—The Wisconsin Valley and the Chicago, Clinton, Dubuque & Minnesota do not yet appear on list of roads worked by this company, indicating that the transfer is not yet completed. The last-named line is to be extended into Clinton, Ia., by building about eight miles of new road where the Iowa Midland track is now used. Possession will probably pass about Sept. 1.

Work has been begun on the extension of the lately purchased Mineral Point road from Mineral Point, Wis., north to Dodgeville, about seven miles.

The St. Paul Pioneer-Press speaks as follows of the new lines and extensions this company now has in progress in Minnesota and Dakota:

"The greatest exploits are being done in Dakota, where they have 1,200 men at work and where, by the close of the season, they will have built over 300 miles of new road in this territory. The Hastings & Dakota road is being extended from the Dakota boundary line at Big Stone City due west for 100 miles to the James River, striking it about 100 miles south of the Northern Pacific Railroad. By the first of August, 30 miles of this track will be down; the balance by November. Beyond the James River toward the Black Hills there have been no surveys made, although exploring parties have penetrated some distance west, and until the country is carefully examined by competent engineers, it is uncertain in which direction the road will go west. Twelve miles west of Big Stone City, a branch line called the Whetstone Branch is being built in a northwesterly direction up the Whetstone River. It will extend for 30 miles this season and stop at a point 10 miles due west of Brown's Valley, which latter place lies between Big Lake and Lake Traverse. This line is evidently heading for the Northern Pacific Railroad at the crossing of the James River. Another line is being built on its western side, directly toward Jamestown, on the Northern Pacific. Forty miles of this north and south extension will be completed by November next. The grading on the Flandreau line from Flandreau to Sioux Falls, 49 miles in length, is finished with the exception of a slight amount of work in some heavy cuts, and will probably be ironed this year, though this will not be fully decided upon until some time later in the season. The line west of Flandreau, known as the Southern Minnesota Division, is being pushed toward the Black Hills, and will reach the Vermillion River, 45 miles west of Flandreau, early in the fall. Three-fourths of the grading is done already, and tracklaying will follow as soon as the road-bed is ready. The Black Hills Extension of their Iowa & Dakota line, which was built to Mitchell last fall, is likewise being pushed, and cars will be running as far as the Missouri this fall. Mitchell is at or near the James River in Southern Dakota, and a large force of men are scattered along the route between there and the Missouri. The road reaches the Missouri by way of American Creek and goes out on the west side by American Crow Creek. Beyond this the surveyors have penetrated some 70 miles toward the Black Hills, to a point near the 100th meridian, where they were stopped by the Sioux Indians. Negotiations with the savages for right of way through their territory are now pending. The company has just completed a short line in the southeastern part of the territory to connect the line which runs from Sioux City to Sioux Falls with their line to Yankton. It is called the Elk Point Cut-off, and is six miles in

length. In Iowa, they are building 10 miles of road from Rock Valley to Eden in Minnesota. The company is building what is known as the Hastings & Dakota Cut-off, which runs from Minneapolis to Benton, a distance of 30 miles. Three hundred men and 150 teams are now at work. The line will come into Minneapolis by way of the St. Paul, Minneapolis & Manitoba, or the Minneapolis & St. Louis road from Cedar Lake. Grading will be finished by Oct. 1, and iron laid within 30 days after. In addition to this, the company is constructing a double-track short line between Minneapolis and St. Paul, spanning the Mississippi River at Meeker's Island with one of the most magnificent double-track railroad bridges in the country, 143 ft. above the water. This line will be completed by Sept. 1 or before."

The gauge of the branch line from Lone Rock, Wis., to Richland Centre (formerly the Pine River Valley & Stevens Point road) was changed from 3 ft. to 4 ft. 8½ in. on Aug. 1. It is 16 miles long.

Chicago, Rockford & Northern.—In Chicago, July 26, the United States Circuit Court made an order directing the Receiver of the Chicago & Iowa road to operate this road. The order is provisional only, and does not decide the questions in litigation, or specify whether the Receiver is to work the road under the lease of 1875, or under the agreement said to have been made in September, 1877, between the two companies and the Chicago, Burlington & Quincy. These questions are left for further consideration.

Chicago, Rock Island & Pacific.—The branch from Guthrie Junction, Ia., north by East to Guthrie Centre, about 14 miles, has been completed and opened for business.

A dispatch from Des Moines, Ia., July 30, says: "In the case of Sillbridge against this company, a complaint was made to the Railroad Commissioners that the Rock Island Company refused to receive refrigerator cars of the Merchants' Dispatch Company from the Toledo, Peoria & Warsaw Railroad and haul them to Ottumwa and return them to the Toledo, Peoria & Warsaw, on the ground that the latter was not a connecting road, within the meaning of the statute. The Commissioners decide that the statutes include the mutual receipt and delivery of cars, no matter who owns or manages the intersecting line, and includes the cars of all transportation companies or persons."

Chicago, St. Paul, Minneapolis & Omaha.—The Northern Division (formerly the North Wisconsin road) is now completed and opened for business to Chandler, Wis., 10 miles beyond the last year's terminus, and 80 miles from the junction with the Eastern Division near Hudson.

The spur from Menomonee Station on the Eastern Division (the Chicago, St. Paul & Minneapolis road) to the town of Menomonee, Wis., has been completed. It is two miles long, and reaches the large lumber mills adjoining the town.

The line from Covington, Neb., to Ponca, formerly the Covington, Columbus & Black Hills, has been changed from 3 ft. 6 in. to standard gauge, and was reopened Aug. 1. This line forms part of the Omaha connection, its terminus being on the Missouri opposite Sioux City. The Omaha line leaves it at Colburn Junction, 10 miles from Sioux City, and will run westward 17 miles to Kenesaw Junction, then turn southward and run about 50 miles to Oakland, where it will connect with the line already completed to Omaha, 63 miles, formerly the Omaha & Northern Nebraska. This will make the line from Sioux City to Omaha about 140 miles long. From Kenesaw Junction to Norfolk, 43 miles, a branch is under construction, which will, as noted last week, be used in common with the Union Pacific. Work on the new lines in Nebraska is being vigorously pushed.

The United States Circuit Court has dissolved the junction against making a connection between the tracks of this company and the Burlington & Missouri River in Nebraska across the Union Pacific tracks in Omaha. The Court holds that the two companies have a right to cross the Union Pacific.

Denver & Rio Grande.—This branch road from Colorado Springs, Col., to Manitou is completed and has been opened for business. It is six miles long and connects Manitou, which is quite a noted summer resort, with the main line.

Detroit, Mackinac & Marquette.—The work of laying track on the first section of 20 miles out of Marquette, Mich., was completed last week, and this section will soon be inspected by the state officers. On the second section of 20 miles, much of the grading is done, but there are several heavy cuts and fills which will take some time yet to finish.

Elkton & Middletown.—Books of subscription to the stock of this company have been opened. The estimated cost of the road is about \$180,000, and Baltimore parties have promised \$100,000 of this amount. The line is from Elkton, Md., on the main line of the Philadelphia, Wilmington & Baltimore, southeast to Middletown, Del., on the Delaware Division, a distance of 14 miles. It will be a short cut for business going to Baltimore from the Delaware Division.

Forest Park & Central.—This company purposes building a suburban road from Forsyth, a few miles from St. Louis, on the Wabash, St. Louis & Pacific road, by way of Clayton to Creve Coeur Lake, a distance of 16 miles. Part of the line was graded several years ago for the St. Louis County Railroad. Trains will run to the Union Depot in St. Louis over the Wabash, St. Louis & Pacific track.

Grand Rapids, Greenville & Bay City.—This company has been organized to build a railroad from Rockford, Mich., 10 miles north of Grand Rapids on the Grand Rapids & Indiana road, east by north through Greenville and Midland to Bay City, about 90 miles. The line from Rockford to Greenville, 15 miles, was graded several years ago. The company is apparently organized in the interest of the Grand Rapids & Indiana.

Grand Trunk.—This company offers in London a new issue of £1,000,000 perpetual 5 per cent. debenture stock at 105. Payment is to be made £10 per share on application; £30 on allotment or by Sept. 1; £50 on March 31, 1881, and £15 on July 1, 1881. Int. rest will be allowed on the installments from date of payment. Scrip will be issued on allotment, to be exchanged for the stock at time of final payment. This issue will not increase the capital of the company, as its proceeds are to be used to pay off the following preference securities:

International Bridge bonds, now being paid	243,200
Montreal & Champlain bonds, now being paid	102,800
Montreal sanitary debentures, now being paid	20,548
Sundry land mortgages, now being paid	37,824
Atlantic & St. Lawrence Portland City bonds, now being paid	161,700
British American Land Co. annuities, due Jan. 1, 1881	20,548
At. & St. Lawrence second-mortgage bonds, due April 1, 1881	369,900
First equipment mortgage bonds, due April 15, 1881	16,100
At. & St. Lawrence third-mortgage bonds, due May 1, 1881	147,300
Montreal & Champlain bonds, due July 1, 1881	164,400
International Bridge bonds, balance, due July 1, 1881	23,680
Total	£1,048,000

The yearly interest charge on these bonds is £63,968, so

that by the new issue the company will save £13,908 a year in interest, besides putting the debt in a better shape.

Grinnell & Montezuma.—Local papers state that arrangements have been completed for the extension of this road from Montezuma, Ia., south about 15 miles to the coal mines at What Cheer; also from Grinnell northwest to State Center, about 40 miles.

Hudson Tunnel Railroad.—Work has been continued through the week pumping out the tunnel and shaft, but very slow progress has been made and the coffer-dam seems to have been of little use. On Aug. 4, however, it was thought that the leak through which most of the water enters the shaft had been discovered, and the pumps began to make some headway. It is impossible to say how soon the workmen will be able to enter the tunnel again.

Illinois Central.—In compliance with an ordinance passed by the Chicago City Council, this company is about to build a viaduct extending Lake street across its tracks. It will begin at Michigan avenue, and will have a roadway 20 feet wide and two sidewalks, each 5 feet. The approach at Michigan avenue will be of cut stone, surmounted by ornamental parapets and lamp-posts. The viaduct proper will be of iron, very ornamental, and will be 1,375 feet long; at the east end, the approach will be 50 feet long. The total cost of the viaduct will be \$100,000. It will be the finest and most ornamental in the city. It is constructed in order to give easy access to the lumber yards east of the tracks, which are not easily reached at present.

Jacksonville & Southeastern.—Work is progressing well on the extension of this road, from Virden, Ill., south to Litchfield, about 25 miles. The company expects to have it completed by October.

Joliet & Valparaiso.—The books for stock subscriptions were opened in Joliet, Ill., July 27. Most of the right of way has been secured, and proposals have been received from contractors for the building of the whole road.

Lake Champlain & St. Lawrence.—This road has been changed from 3 ft. 6 in. to standard gauge, and will be worked in connection with the Central Vermont. It extends from Stanbridge, P. Q., northward to St. Guillaume, 63 miles, and is extended to run to the St. Lawrence River, some 40 miles further.

Louisville, Harrod's Creek & Westport.—This road is now worked by the Louisville, Cincinnati & Lexington Company as a branch. It is of 3 feet gauge, and extends from Louisville, Ky., to Prospect, 11 miles.

Manchester & Fitchburg.—Committees from Manchester, N. H., and Fitchburg, Mass., have recently been in consultation as to the possibility of building a railroad to connect the two cities. The distance is about 35 miles, and the connection is much desired by the Manchester manufacturers, whose railroad lines are all under the control of the Concord Company. The project has been under discussion several times before.

Manhattan Elevated.—Two of the trust company presidents, Messrs. Henry Parrish and Edward King, have declined to serve as arbitrators in the proposed consolidation agreement between this company, the Metropolitan and the New York Elevated. Messrs. H. G. Rolston, John A. Stewart and Henry F. Spaulding have, however, agreed to act, and the agreement will be submitted to them. Each company names two of its directors to submit its claims. The point which the arbitrators are to decide is the value at which each company's stock is to go into the consolidation.

Marietta & North Georgia.—Work has been resumed on this road, and a force of convicts is now grading an extension from the present terminus at Canton, 23 miles from Marietta, Ga., northward to Jasper, in Fickens County, a distance of 20 miles. It is intended to keep at work until the road is finished to Murphy, N. C., over 100 miles from Marietta.

Medford & Camden.—Work is being pushed on this road by the contractor, James J. Ryan, of Philadelphia. The line is 11½ miles long, from Medford, N. J., westward to Haddonfield on the Camden & Atlantic road. About half the grading is done and tracklaying will soon be begun. The road will be worked by the Camden & Atlantic Company.

Memphis & Charleston.—Surveys continue to be made for the proposed extension of this road from Stevenson, Ala., to Chattanooga. Whether the road is built or not probably depends upon whether a contract can be made for the use of the Nashville, Chattanooga & St. Louis track between those points, which will be more acceptable than the existing one. A conference on this point was held in Chattanooga last week, but the result was not made public.

Midland, of New Jersey.—This company is negotiating with the Middletown, Unionville & Water Gap Company for a new lease of its road and a reduction of the rental. The rent now paid is 7 per cent. on \$123,850 stock and \$400,000 bonds, and \$500 for general expenses, about \$37,200 in all. It is understood that the Midland offers \$20,000 a year. The 12 miles of the leased road, from Unionville to Middletown, furnish the largest part of the milk, which is the most profitable business of the road. The Erie would probably be willing to lease the road, should the Midland give it up.

Minneapolis & St. Louis.—This company is having a survey made from Ft. Dodge, Ia., to Des Moines. The line is on the east side of the Des Moines River, and 15 to 20 miles east of the Des Moines & Ft. Dodge road.

Missouri, Iowa & Nebraska.—The track is now all laid on the Centreville, Moravia & Albia branch, which extends from Centreville, Ia., on this road northward 25 miles to Albia, where it crosses the Chicago, Burlington & Quincy and connects with the Central Iowa. Regular trains will soon be put on, and will be run through between Keokuk and Albia, the line from Centreville to Corydon being worked as a branch for the present.

Work has been begun on the extension from Corydon, Ia., westward, and will be pushed forward as fast as possible.

Missouri, Kansas & Texas.—The track of the Denison Division is now laid to Leonard, Tex., 10 miles beyond the late terminus at Whitewright. The road is graded for 10 miles further.

Missouri Pacific.—Notice is given that E. D. Morgan, Surviving Trustee, will receive proposals at his office, No. 54 Exchange place, New York, for the sale to him of second-mortgage bonds or of first-mortgage bonds to the amount of \$50,000, in pursuance of the terms of the second mortgage. Bids must not exceed par.

Mobile & Ohio.—At a meeting of the board held Aug. 4 it was resolved to appropriate \$380,500 of the earnings of the fiscal year ending June 30 last to pay interest on the income and sinking fund debentures. It was resolved to make payments as follows: On the first-preferred income and sinking fund debentures 3½ per cent. Sept. 1, 1880, and

